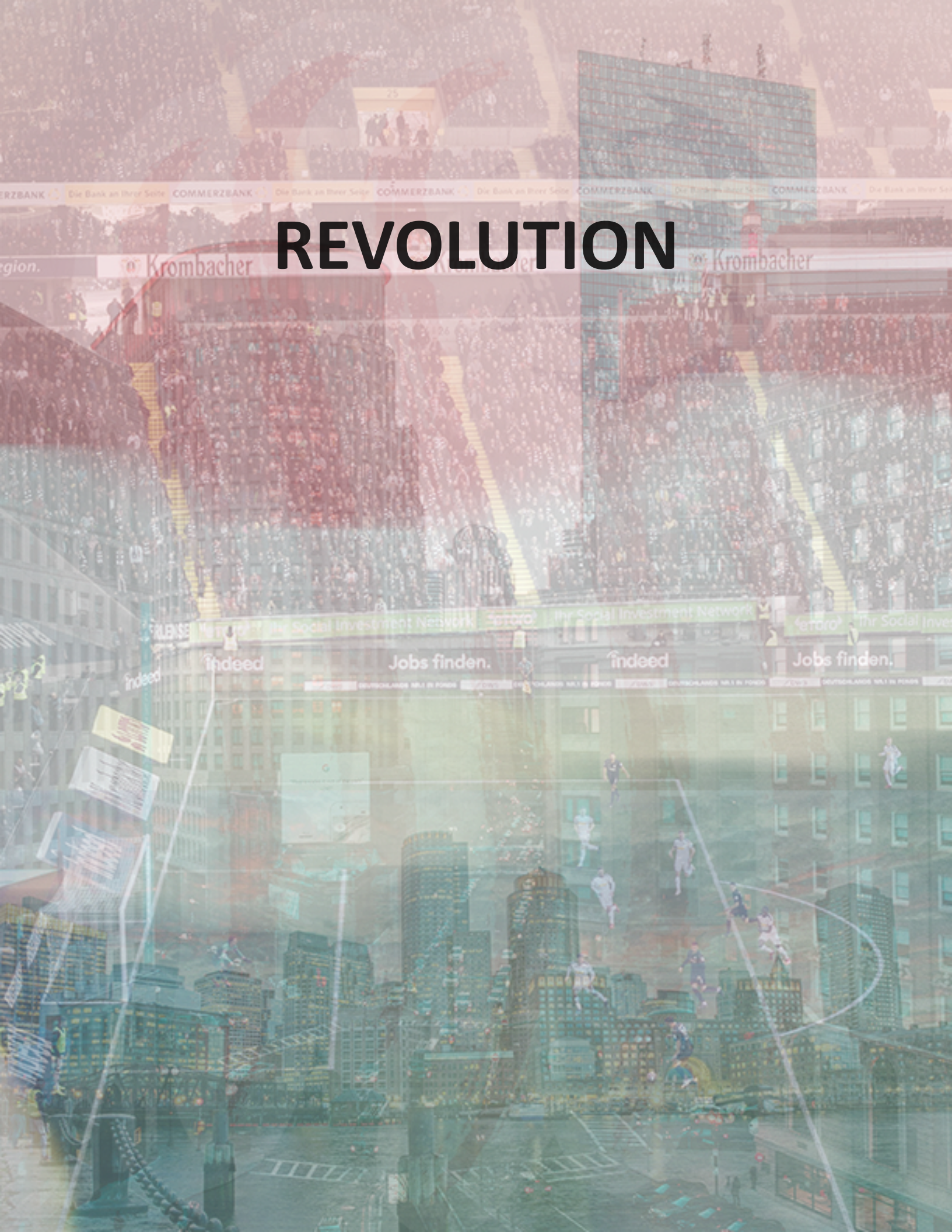

REVOLUTION
Krombacher
COMMERZBANK
indeed
Jobs finden.

REVOLUTION

A Design Thesis Submitted to the

Department of Architecture

North Dakota State University

By

Spencer Bumby

In Partial Fulfillment of the Requirements

for the Degree of

Master of Architecture

May 2021

Fargo, North Dakota

Figure 1

Table of Contents

List of Tables and Figures

Thesis Proposal

Figure 2

Figure 3

Thesis Abstract

Initial Question:

How can we design stadiums to better serve their communities: visually, physically, and financially?

In the last decade, there has been a trend in the United States to design and build soccer-specific stadiums for Major League Soccer (MLS) teams. While most teams now have a soccer-specific stadium, there are few teams who have not yet followed on the trend due to no immediate desire to move to a new venue. Like most stadiums and arenas, the general public does not view the public funding of them in a favorable manner. This is due to their increasing costs and lack of return of investment for their cities. Even when publicly funded on the hands of the tourists, many argue that the extra revenue should be invested in the community instead of the sporting venues.

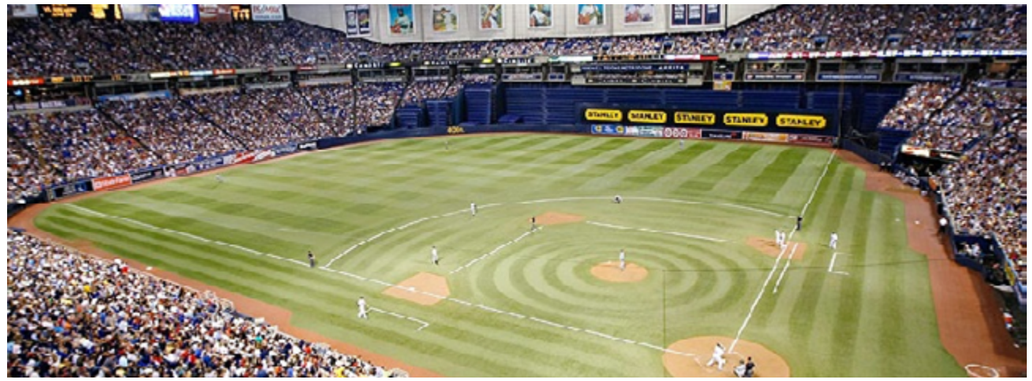
One of the more recent trends within stadium design has been to create large entertainment districts surrounding the stadiums. We have seen this be very successful for football stadiums and baseball parks, leading to new developments in cities that see high daily usage. Even though the surrounding context has significant usage, the stadium anchoring this neighborhood is still unused most of the year. The stadiums are also generally locked and closed off on the many days that they aren't being used. To create a resolution to this issue stadiums should be designed with mixed uses as a priority to generate year-round revenue and become more connected to their cities.

Thesis Narrative

Over the span of the last 20 years, the cost of stadiums has significantly increased. In the late 1990s and early 2000s, the average cost of a football stadium was around $200 million (Zimbalist & Noll, 1997). while stadiums built in 2020 have seen costs as high as $1 billion+ (Saporta & Wenk, 2014). While the cost to build a new MLS Stadium is significantly lower compared to other the NFL, $350 million is still a high price for the taxpayer to foot. Previously, stadiums were publicly-funded by the states and local cities and was accomplished through municipal bonds. These new stadiums were pitched as high-revenue generators for their communities. These stadiums ended up being costly to maintain and weren't able to offset the initial costs that came with construction. When the revenue was not enough to pay off the cities bonds, they had to use alternative sources such as a sales tax. Along with their increasing construction costs, stadiums consume great amounts of land in urban settings and remain vacant for over 75% of the year.

While the overall cost to construct new stadiums has been an issue, another significant issue that comes with this is the lack of usage compared to its cost. While some leagues see great usage of their stadiums and frequent home games with MLB at the highest with 81 home games per year (ESPN,2019,) not every sport has that same luxury. For reference, and using the regular season as context, the average MLS team will only host 17 games per year (Spedden, Z.) Due to this struggle, making a venue multi-purposed to an extent can be crucial to give it a longer yearly life. In the case of an MLS Stadium, this would be hosting football games, concerts, or football/soccer at the collegiate level. Previously, to multipurpose the stadiums, multiple teams would actually share the venues to be better stewards of the state's tax dollars. Examples of this would be the Hubert H. Humphrey Metrodome in Minneapolis, MN, where they were able to play football, soccer, baseball, and concerts year-round due to its domed roof. While this seemed practical at the time to satisfy all of the team's needs and the city's needs, the stadiums ended up being inadequate for all of the parties involved. Because each sport requires different viewing angles to satisfy the fans, the lack of a viewing experience worsens the fan experience. By the end of its life, due to these conditions, the Metrodome was considered one of the worst ballparks in baseball. (O'Malley Greenburg, 2009)

In the following trend of stadium designs, each team looks to build their own stadium to ensure perfect views from every seat. They also have desires to bring new and unique experiences to the stadium to combat the television experience at home and draw people into the stadium. To use one city as a case study for stadiums, we will use Minneapolis/St. Paul, Minnesota. For reference, the Hubert H. Humphrey Metrodome was replaced by US Bank Stadium and Target Field with a combined cost of $1.61 Billion (Nobles, 2017). Of that $1.61 Billion, approximately $848 Million was publicly funded by the city of Minneapolis, Hennepin County, and the state of Minnesota. Along with this financing, the local government also invested $74 million into the $140 million renovation of the Target Center and over $65 million in funding to the Xcel Energy Center in St. Paul (Nobles, 2017).



Figures 4-6

What we see in Minneapolis/St. Paul is one of the more common methods of stadium financing, a public/private partnership that has both the team and the community paying for it in the hopes that both parties financially benefit from the agreement. For the communities, their portion of the bill is typically funded through tourism taxes to leave the financial burden off of local residents. Even though the residents see that it is not their money paying for it, many would prefer to see the money from the tourists be put back into the city by financing things other than entertainment. Even if the city of Minneapolis is able to make up the hundreds of millions that they gave to this project, a price tag like $848 Million could have funded game-changing developments or projects that would be used by its citizens. Projects it could have funded include a new Metro Light Rail line, the new I-94/I-35W construction, or other large projects. Many believe that stadiums should be entirely privately funded, but as of 2020 this has yet to become a norm due to the competitive nature of franchises. In many cases, like in Minneapolis/St. Paul, the arenas have been partially funded by the local government in hopes to retain a team or to attract a new team. The Xcel Energy Center

was built to attract the NHL's Minnesota Wild, and was successful in doing so in 2001. To avoid relocation, as threatened by the Vikings, the new US Bank Stadium had some funds coming from local government. While this practice has been seen in a negative light, it is one that has yet to be changed. If the governments are stuck funding these projects, it is in their best interest to find proposals that will lead to nearby redevelopment to give the city some level of visible and/or financial return. This concept has led to the most recent trend in stadium designs, which is a concept that sees these anchor stadiums building up the space around them.

The newest trend of stadium design involves more than just a facility, but a neighborhood. One of the primary examples of this is The Battery, a live-work-play complex anchored by Suntrust Park in Atlanta, Georgia. Built out in the suburbs of Atlanta, the stadium itself is surrounded by offices, restaurants, and shops that have attracted swarms of visitors. More than just bringing in visitors, the complex also includes three apartment buildings, giving itself year-round and everyday activity. The idea behind this development is that interest in the site will only continue growing as it finishes development and people begin to come. The end result of this would be more projects in the area, giving the city something far better than a new stadium: a new lively neighborhood. Based on recent numbers, they have found that the development makes up to $19 Million annually, all of which goes back to the community. Of that $19 Million, $4 Million goes to the Cobb County government and $15 million goes toward Cobb County schools, and will continue to do so for the next 20 years. While $19 Million might not make back the entire cost of the development any time soon, the profits of it allow the communities to have some financial prosperity opposed to a crippling debt they struggle to pay off.

Figure 7

From The Battery, we have been able to see that stadiums indeed are catalysts for development, and can even start one from scratch in suburban settings. However, not all cities are built the same and have the luxury to allot large areas of land for these developments. Many can round up enough space for the stadium itself but would have to demolish existing buildings to accommodate new construction. In Boston, we have seen almost the opposite method of stadium building that was able to accomplish a similar feat. Fenway Park, the anchor and namesake of the Fenway-Kenmore neighborhood, has featured many renovations within its 108 year life, with little renovations or expansions occurring until 2002. In 2002, when faced with the tough decision to either tear down the ballpark or invest a large sum of money, the Red Sox decided to pay the $300 Million to keep the park alive. With the investment in the ballpark came an investment with the neighborhood. Now that it was well known in Boston that the Red Sox would stay, all of the developers had the knowledge that 3 million people would walk through this neighborhood every year. Since that time, property value in the Fenway-Kenmore neighborhood has nearly doubled and has seen an increase in new housing, restaurants, and retail spaces with many more proposals on deck. Within Boston, we have already seen the impact that a stadium can have on a neighborhood. Due to this, one could easily assume that a similar result could occur in a different area of Boston provided that there is sufficient area to develop.

In the instance of Widett Circle neighborhood in Boston, it's an opportunity to create a new midtown for the city from scratch. Similar to Hudson Yards in New York, the development would be built over an existing railyard that consumes a large patch of space in an urban core. The best way to kick off that development and encourage others to follow? A new Major League Soccer Stadium. With $400 Million already on the table from the team's owner, the stadium proper would not require any public funds from Boston or the state of Massachusetts. What we have seen in the evolution of trends leads to a future idea of a stadium that operates as public space first and a stadium second. Even as a privately funded stadium, there is extra money to be made for both the owner and the city by having a space that is usable almost consistently. By developing this open concept adjacent to the public transportation, the remainder of Widett Circle could be developed and would require a vast majority of the circulation to go through the proposal. Not only would this project jump start a new life to this neighborhood, it would also provide jobs, increased brand presence, and public recreation space.

Project Typology

Mixed-Use Development, MLS Stadium

In a typical MLS Stadium, the fans enter either the stadium at either the field level or the concourse level through secure entrances only opened on game days. For security measures, the team spaces are only accessible to those with the required credentials and the field of play is off-limits to non-essential staff of the team. Along with this, the typical stadium has a façade that closes it off to the public, with the exception of few restaurants or stores located on the building's perimeter.
For the typology of a mixed-use stadium, I believe it needs to incorporate more diverse elements within its footprint that can be used daily. One example of this development would be a stand-alone movie theatre inside the stadium that can convert into stadium suites on game days. A similar intent could be incorporated into restaurants as well, which could convert to clubs and concession stands on any given game day. On one on the four sides of the stadium, a hotel could be built in which is more than able to be used on a daily basis. One side of hotel rooms would be able to have direct views of the playing field, which could be branded as such as include layouts that allow for proper viewing from these windows. This concept could be transferred to apartment units as well, giving the complex the ability to be branded as a live-work-play development.

Location: Boston, Massachusetts

Typological Case Studies

Figure 9

Figure 10

Target Center

KMR Architects, Sink Combs Dethlefs (2017), Spencer Bumby, Proposal (2020)

Description

Located in Minneapolis, Minnesota, the Target Center is a multipurpose event center that primarily houses the NBA's Minnesota Timberwolves, WNBA's Minnesota Lynx, and various concerts. Owned by the city of Minneapolis, the center is roughly 831,000 square feet and has a capacity of 19,580. Over the course of its life, it has undergone multiple renovations and additions. After seeing the need for additional renovations to maintain its life through the existing 2035 lease, I used the Target Center renovation as a prompt for my Spring 2020 urban design studio to add more mixed use space in the building and reinforce the building's connection with the Minneapolis Skyway.

In the heart of Downtown Minneapolis, the Target Center is surrounded by 1st Ave N , 6th St N, 7th St N, and 2nd Ave N. Interstate 394 runs directly west of the Site, acting as a buffer between the Center and Target Field. Due to Target Field's use, this site sees up to 3 Million visitors yearly during the summer months. To connect the two, a plaza was built over the interstate. Within a one block radius are three prominent downtown parking garages in Hawthorne Ramp, Ramp A, and Ramp B, all directly connected to the building via the Skyway. With this connection, the arena is utilized by roughly 20,000 people every day during their morning and afternoon commutes. The center is also one block away from the Warehouse District / Hennepin Light Rail station, the famous First Avenue nightclub, and the Mayo Clinic Square complex. The loading dock for the Target Center is located along 7th St N, the VIP Entrance is located along 1st Ave N, and the primary spectator entrance is at the corner of 1st Ave N and 6th St N.

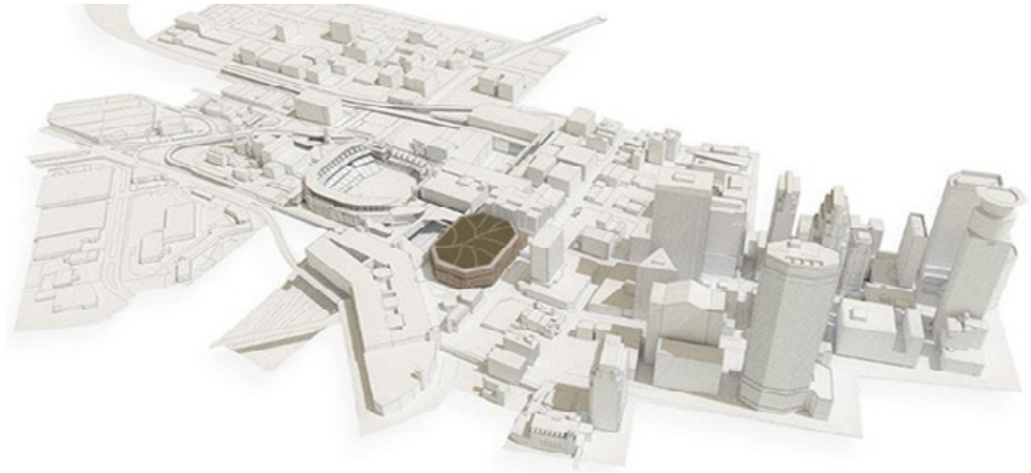


Figure 11

Minneapolis Skyway

The Minneapolis Skyway is one of the largest enclosed pedestrian systems in the world, with over 9 miles of pedestrian walkways spanning 80 blocks of Downtown Minneapolis. The system generally runs along the second or third story of the buildings, with many of these buildings utilizing that floor for retail and restaurants to serve the building's occupants. Residents of this area are able to shop, work, and live without ever having to step outside of the buildings due to this intricate connection. While many cities may not see a need for such level of enclosed walkways, the cold climate of Minnesota leaves this an object to be desired in the winter months. In the context of the Target Center, this allows the spectators to go directly from their vehicles in a covered garage to their seats without ever physically challenging the outdoor elements.

Within the Target Center, the Skyway runs through the northern end of the arena and runs along the exterior of the western side. There are three main points of entry into the Target Center, two that exist in the Skyway and one that exists on the ground level at 1st Ave N. However, the ground entrance is only able to be used by VIP Spectators entering the Lexus Courtside Club. To enter the primary point of circulation, one has to enter the Skyway, pass through the security checkpoints on the northern end of the building, and advance upwards using either the escalators, stairs, or elevator. The third point of entry, which also exists inside the Skyway, allows spectators to directly enter the main concourse from the southwestern corner of the building.

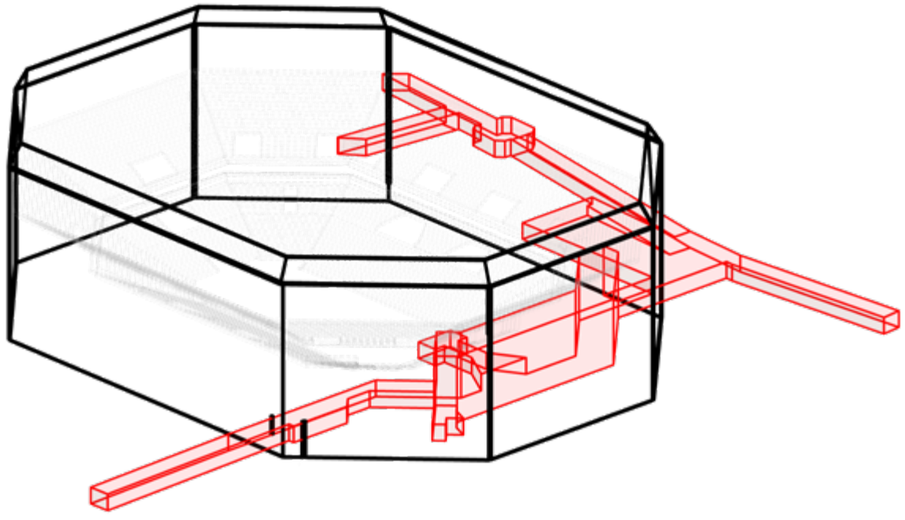
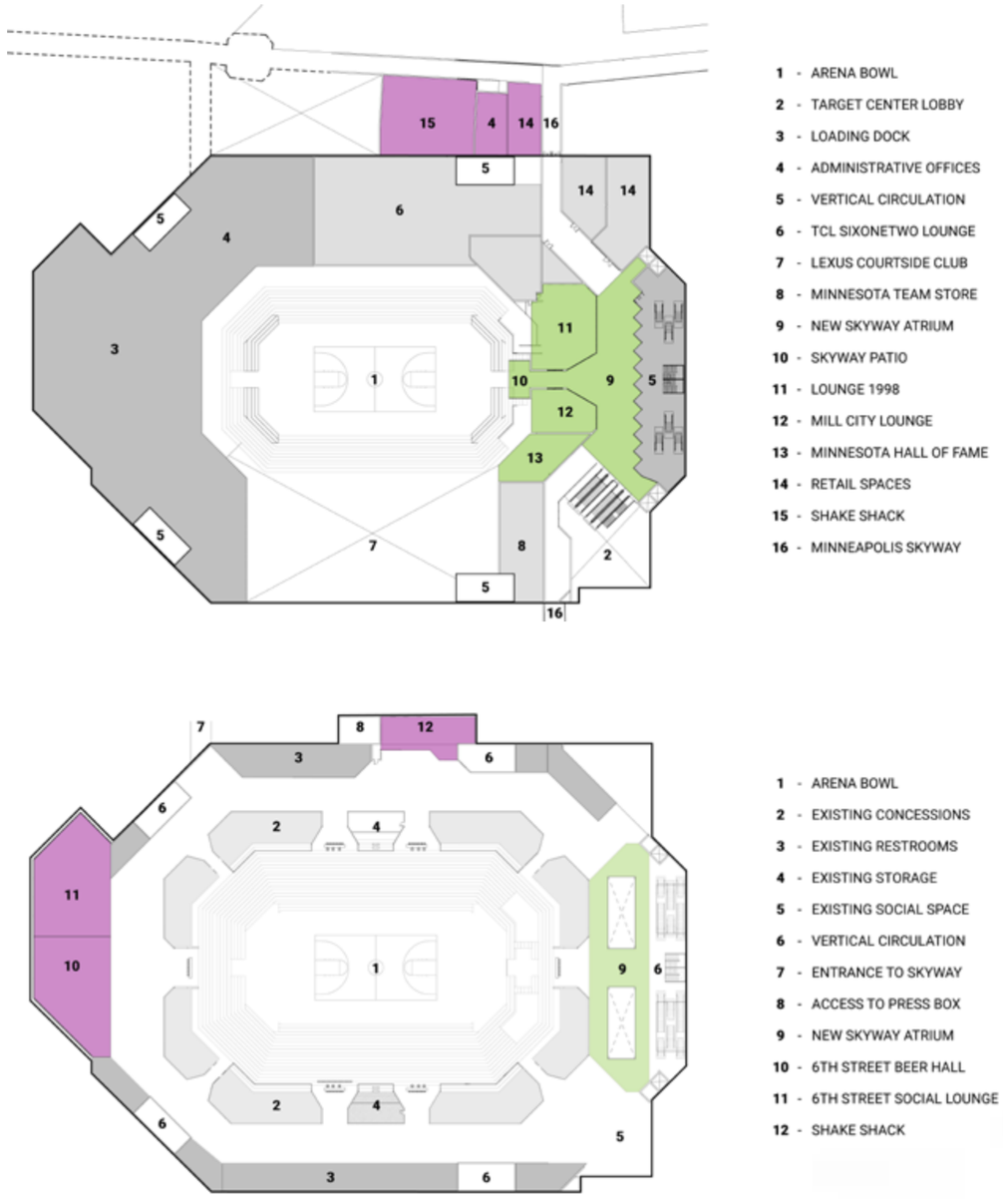


Figure 12

Floor Plans



Figures 13-14

Skyway Atrium

One of the main components of the Minneapolis Skyway within the Target Center is the entry space, lobby, and retail. As the space currently exists, it is a wide, one story hallway that connects the lobby to the Skyway. Once at the Skyway, the northernmost end is the primary point on entry into the arena, with movable glass partitions. During the game days, these partitions are folded open to allow the fans to enter. On the western end of the Skyway, there is a Jack Link's retail store and an entrance to the SixOneTwo Lounge. The eastern end houses the Timberwolves and Lynx Team Stores, the teams' histories, and the connection to the rest of Downtown Minneapolis.

While these spaces are capable of being utilized during off-days, they are primarily targeted toward the Timberwolves and Lynx. This would lead to a lack of interest, particularly during the periods of the year when they do not play. The proposal removes the primary wall that features the two teams histories, and replaces it with two new lounges that serve multiple function capture visitors year-round, the two Skyway lounges intend to be open routinely after being converted from arena lounges into normally functioning restaurants. With the atrium now being a primary feature of the arena, more visible branded is able to be given to the Timberwolves, Lynx, and any other sponsors who might have advertisements in the space. With proper security measures in place, the other floors of the arena are able to be opened up as well. This is mostly done through the bridges that link the entry space to the arena that are capable of being sealed off. Overall, the atrium design highlights that mixed uses can be built into sports stadia and they are also capable of handling daily pedestrian traffic that does not involve a sporting event.

Figure 15

6th Street Beer Hall + Social Lounge

Located directly above the loading dock on the southern end of the Target Center, the 6th Street Beer Hall and Social Lounge intend to elevate the game day experience at the Target Center through a unique environment within the arena to watch the game. Following recent trends, fans have expressed desires for secondary spaces to enjoy the games outside of their paid seat. While fans are still primarily paying for said seat, it is rare that a spectator will stay seated there the entire game. As they get up to circulate around the arena, it can be ideal for both parties if they are able to land in a space like a Beer Hall or a lounge space where they can play games or enjoy their food. Due to its direct connections with both the Skyway and the arena, this space is also able to be utilized by fans who are looking to enjoy food and drinks before the game or after the game.

Within the Target Center, the Skyway runs through the northern end of the arena and runs along the exterior of the western side. There are three main points of entry into the Target Center, two that exist in the Skyway and one that exists on the ground level at 1st Ave N. However, the ground entrance is only able to be used by VIP Spectators entering the Lexus Courtside Club. To enter the primary point of circulation, one has to enter the Skyway, pass through the security checkpoints on the northern end of the building, and advance upwards using either the escalators, stairs, or elevator. The third point of entry, which also exists inside the Skyway, allows spectators to directly enter the main concourse from the southwestern corner of the building.

Figure 16

Figure 17

Banc of California Stadium

Gensler

Description

Located in Los Angeles, California, the Banc of California Stadium highlights some of the newest features in soccer stadium designs and the most recent desires from fans. Home to the Los Angeles Football Club (LAFC) the stadium continues on with the trend of creating soccer-specific venues within the United States. Along with being designed specifically for soccer, we also see the trend creating venues smaller than a football stadium, with capacities typically hovering around 20,000. In this case, the stadium has a capacity of roughly 22,000 spectators within 100,000 square feet.

From an overall perspective, the Banc of California Stadium is one of the newest stadiums that looks to provide its every visitor with the best experience possible from when they enter to when they leave. This experience was created through unique design elements targeted at everyone from new fans, visitors, and dedicated supporters. The Safe Standing section as pictured below is an example of the more recent trends to be seen in MLS Stadiums. As I look to design a new MLS Stadium for the New England Revolution, there are many design factors, elements, and technologies that could be incorporated in the next few months.

Figure 18

Safe-Standing Seating

One of the most prominent seating features in the Banc of California Stadium is the Safe-Standing seating that is home to LAFC's Supporter's club, the 3252. Designed at a pitch of 34 degrees, it is the steepest pitch allowed in the MLS and helps create a wall of people and sound to boost the home field advantage. While other Safe-Standing seating sections have been created in the MLS previously, this will be the first one to also feature seats behind the railings to allow the spectators to sit during intermissions or before games. To further enhance the experience for LAFC's loyal, there is a bar located at the top of the section that can only be accessed from the supporter's section designed by Gensler, Heineken, and the supporters through multiple design sessions.

Designed with flexibility in mind, the bottom halves of the two middle section are able to be retracted and create a space for a concert stage to be placed. With this location being utilized, only 3,000 of the 20,000 seats in the stadium would not be able to be used. On the other hand, that loss of capacity is able to be offset by using the playing field itself for extra floor seating and bleachers at a restricted height. Through this simple move and seamless conversion, the Banc of California Stadium is able to hold a second life during LAFC's offseason as a secondary outdoor concert venue in Los Angeles.

Figure 19

Sunset Deck

Located along the west side of the Banc of California Stadium on top of the press boxes lies the Sunset Club. One of the many specialized lounge spaces within the stadium, it is designed to emphasize the year-round warm climate of Los Angeles. This premium seating space is entirely open air with solar shading areas provided where the seating is located to escape the heat. With over 7000 square feet overall, fans are provided ample space to spread out and walk around the space. From this space, the design seeked to capture the breathtaking views that are available of the Los Angeles Memorial Coliseum and the skyline of Downtown Los Angeles.

With intention in mind, the designers of this social space looked to create an atmosphere similar to that of a Palm Springs oasis. In the viewing area of the club, the space is fitted out with bar height wooden tables and colorful seats to liven the space. For fans desiring to take a step away from the action, they can relax in the comfortable seating or play a few games of ping pong. Provided with each ticket is complementary buffet food service, allowing fans to quickly access their food and minimize the time spent missing the action. From covered cabanas to seats lining a pool, the Sunset Club provides the spectators with an experience that is one-of-a-kind, uniquely Los Angeles, and quintessentially California.

Figure 20

The Fields LA

Directly connected to the Banc of California Stadium, The Fields LA is a newly constructed destination for fans of entertainment and a variety of culinary experiences. The complex is a three story building with multiple dining concepts to create multiple distinct atmospheres all in one. Currently there are nine different vendors in the space who serve different cuisines containing local creations as well as award-winning creations. The variety is very wide with options ranging from seafood to burritos to Mediterranean. On the top of all of this is the Terrace, a rooftop space that provides a view of Downtown Los Angeles with tents available to ensure that the space can always be used. At over 18,000 square feet, the deck is able to accommodate 450 seated guests for any level of events and can hold receptions for 1000 people. This level of event flexibility allows the space to provide the Banc of California Stadium with year-round revenue.

Out of the three stories that the building occupies, two and a half of these stories are used as event spaces for varying purposes. One of the primary event spaces in the building, Free Play, occupies the entirety of the second floor with over 12,000 square feet of interior space. The creation of Chef Tim Hollingsworth, Free Play provides customers with a menu emphasizing classic American bar food accompanied by a bar serving unique cocktails and beers. Not only is it a great location to watch the game, it is also a premier spot to hang out before or after the game for those staying around the area. Home to multiple different event spaces, one of the notable spaces is the arcade with a collection of board games and vintage arcade games. With a capacity of 420 standing room, the in-house DJ provides guests the chance to get out of their seats and dance away. Other spaces within Free Play include private dining areas, large open dining rooms, and an outdoor patio able to hold up to 50 people.

The Fields LA, while not directly intertwined with the Banc of California Stadium, is physically built on to the stadium and plays a major role in the LAFC game day experience. Due to the lack of space in the surrounding Exposition Park neighborhood, there are few parking lots that allow fans to tailgate before the game. However, The Fields gives the fans who can’t tailgate a permanent space to gather before the game to grab food and drink and socialize with other fans. Even when there is not a game at the stadium, The Fields is still a destination for Angelenos due to the culinary variety and social spaces that create a miniature food hall and entertainment district with an atmosphere that should be able to satisfy any customer.

Figures 21-22

Figure 23

CMX Theatre, Old Orchard Chicago

Description

Located inside the Old Orchard Mall in Skokie, Illinois, the new CMX Theatre is the most recent tenant of this complex. The theatre looks to take the traditional movie theatre typology and advance it to the more modern needs of theaters. In order to break through and push forward, there is a need for something more than a standard seat along with the very minimal food and drink selection that theaters currently have.

The CMX Theatre Old Orchard location plans to break the traditional typology through luxury and innovation. This luxury will be done through oversized, plush, reclining seats. As pictured below, it is clear that the seating in this theatre is far larger than the traditional theatre seats and is made to be shared in groups due to the lack of seat dividers. Along with this, the seating is also nicer than the standard seats one might have at home. Because of that factor, customers could be enticed by the experience that would be better than the average at home. Outside of the theaters, the dining options will be fresh and in a wide variety accented with modern finishes. Many of the features of this theatre are relatively new to movie theaters, this being a new trend intending to bring customers back to the cinema. In recent years, with the evolving of movie streaming platforms at the comfort of your own home, there has been a struggle to draw paying customers back to movies. Like sporting venues, a new and unique experience that the average customer cannot have at home is the incentive that will draw people back.

Figure 24

Theaters vs. Stadium Suites

In the thesis proposal, in order to create a truly mixed-use stadium, there need to be other typologies within the site that can utilize the viewing and athletic spaces similar to how the sports typology uses it. In this case, the design would call for a movie theatre to exist directly inside of the stadium to operate independently for 300+ days out of the year. For only 15-30 days of the year, this movie theatre would be able to easily convert into luxury suites for a soccer stadium without having to change the layout of the theatre or build out temporary spaces. If the design would be done effectively, the conversion is one that would be able to happen within a matter of hours, helping to maximize the amount of time that the theatre can operate before or after a game.

The movie theatre typology was primarily utilized as a case study to understand the similarities that already existing between a movie theatre and a suite level in a stadium or arena. On top of this, utilizing a modern prototype of the theatre allows for recent trends in theatre design to be captured and analyzed as well to potentially elevate the amenities present in a standard stadium suite level. These common traits are the main factors that will help understand how to quickly convert a movie theatre into a suite level to bring in the maximum number of customers and revenue. Using a venn diagram, I have examined what they have in common, and more importantly, what they do not have in common.

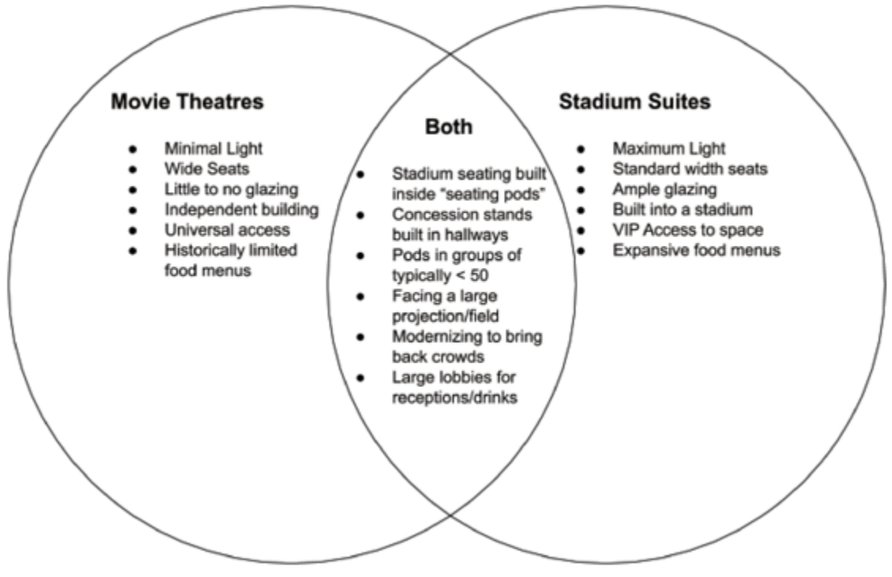


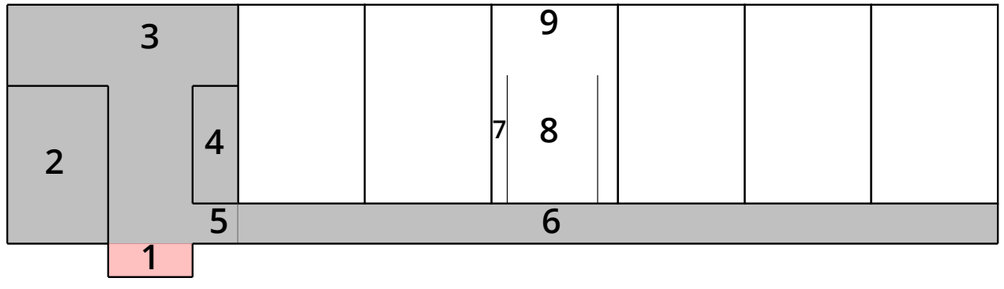
Figure 25

Theaters to Stadium Suite Conversion

Based on the Venn Diagram, it is clear that there are multiple similarities in design and in layout between the two typologies. Based on these similarities, I created a prototype floor plan that would be able to work for both during their specified days of use. To best describe the conversion process from a theatre to a stadium suite level, the previously stated floor plan will be utilized.

From an initial standpoint, there are a few areas that will not have to change during the conversion process. The Food Market, lounges, bar, hallway, and theatre seating will be able to operate as they do regardless of which program is using it. The primary changes during the conversion will come with the security checkpoint and the movable wall/projector due to their necessities based on the function. For movies, it is okay to have only the checkpoint at the hallway to ensure that the customers have a theatre ticket. However, in a stadium suite, it is required to have a ticket to enter the space itself. To combat this disconnect, the checkpoint will be moved in front of the entry when there is a sporting event at the stadium.

Within the theaters themselves, the only change that needs to occur is at the movable wall. When the theatre operates, the wall will be down and blocking out any exterior light to allow films to be projected. When other functions utilize the space, it will have an open view to the field while providing the spectators with a temperature controlled environment.



1 - Lobby / Entrance
2 - Food Market
3 - Lounge Spaces
4 - Bar Area
5 - Security Checkpoint
6 - Primary Hallway
7 - Theatre Entrance
8 - Theatre Seating
9 - Movable Wall / Projector

Figure 26

Sloped Seating

As movie theaters have continued to progress, one of the main design components has been the sloped seating present in most cinemas today. Similar to athletic venues, the cinemas adopted the concept of sloped seating to allow every section to have sight lines with little to no obstruction coming from the people seated in front of them. As shown in the section below, the seats on a steeper slope have a better sight line than the seats that are on the more shallow slope. To enter these theaters, a ramp is installed going from the hallway into the theatre, ending at either the front aisle or in the middle aisle between the two sections of seats.

Within the scope of stadium suites, they generally do not have as many seats or rows as movie theaters do. In a typical suite, the amount of rows could be somewhere around 3 to 4. In some instances, like Fenway Park, there are suite clubs that house capacities similar to what would be seen in the figure below. In any case, the seating needs are the same as theaters, with sloped seats that improve the sight lines for every seat. Since the suites typically are housed in the middle of the seating bowls, the obstruction should be minimized to allow the spectators to look down towards the field and over the heads of those sitting in front of them. In the figure, we also see a wall at the end where the projector typically lies and reinforces the idea that a movable wall to allow or block light is feasible. With this analysis, complimented by the section drawing, one would be able to come to the conclusion that the seating needs for both programs are able to be accomplished through one design.

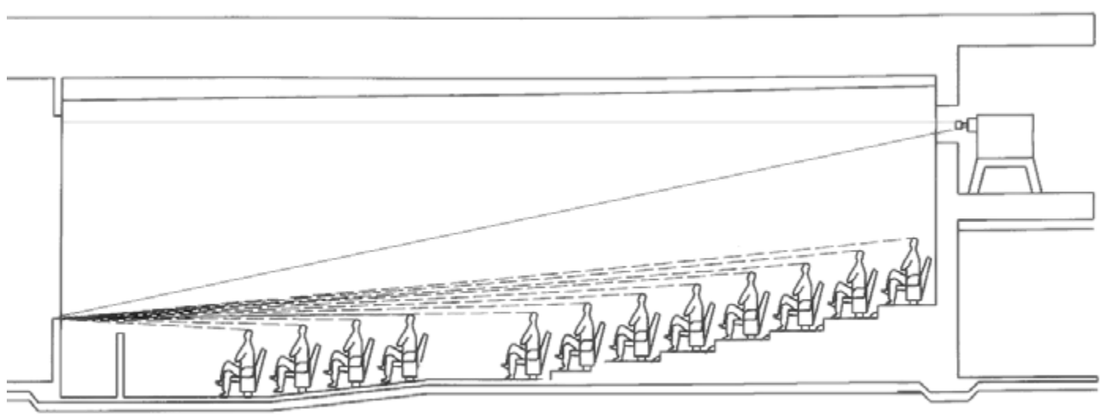


Figure 27

Food Options

Looking at the concessions area of the CMX Theatre, it looks vastly different than any standard movie theatre concession stand. At a standard movie theatre, the concession stands typically consist of popcorn, candy, and sodas. However, in this theatre, it is visible that this concessions is more representative of a Food Hall than a concession stand. This is one of the first movie theaters that has adopted this level of design and is the first attempt of doing so in CMX Theater's existing cinemas.

At approximately 1600 square feet, this CMX Theatre Market offers options previously not seen in its other franchises. Visible in the picture are options of pizza made from scratch, burgers, a deli, a popcorn lab, and shakes. While many theaters already have popcorn as an option, few theaters allow its customers to experiment with popcorn flavors. The Theatre Market looks to emphasize seasonal ingredients as well, helping build on to the culinary trends of their respective markets. Along with the food options, there is also a bar that has beer, wine, spirits, and options of specialty cocktails. Many theaters have already built bars into their theaters, but it is a trend that has continued due to their popularity.

With advanced food and beverage options from a movie theatre aspect, the CMX Theatre is able to attract a wider audience than standard theaters would. From a stadium suite aspect, the culinary options are already on par with what a stadium is capable of offering. However, the Food Hall concept is still widely unused in sports architecture and provides a fresh approach to patrons.

Figure 28

Case Study Summary

Description

As the preliminary thesis program currently stands, the proposal intends to be a mixed-use MLS Stadium. With the MLS Stadium as an anchor, the development will include a hotel, movie theatre, and restaurants within the stadium's perimeter to create visible and financial value in return for the city of Boston. Attached to this complex will be an office building and will serve as a beacon to the remaining Widett Circle redevelopment. To understand how much space will be needed for office space, further research around the site as well as Boston as a whole will be conducted. To ensure proper architectural precedents and quality design, the case studies being used are recently built projects in their respective typologies that seek to continue building on the current trends. In order for a project to be successful and have a long life, innovation should be at the front of the design process and continue on after construction in the form of renovations or additions.

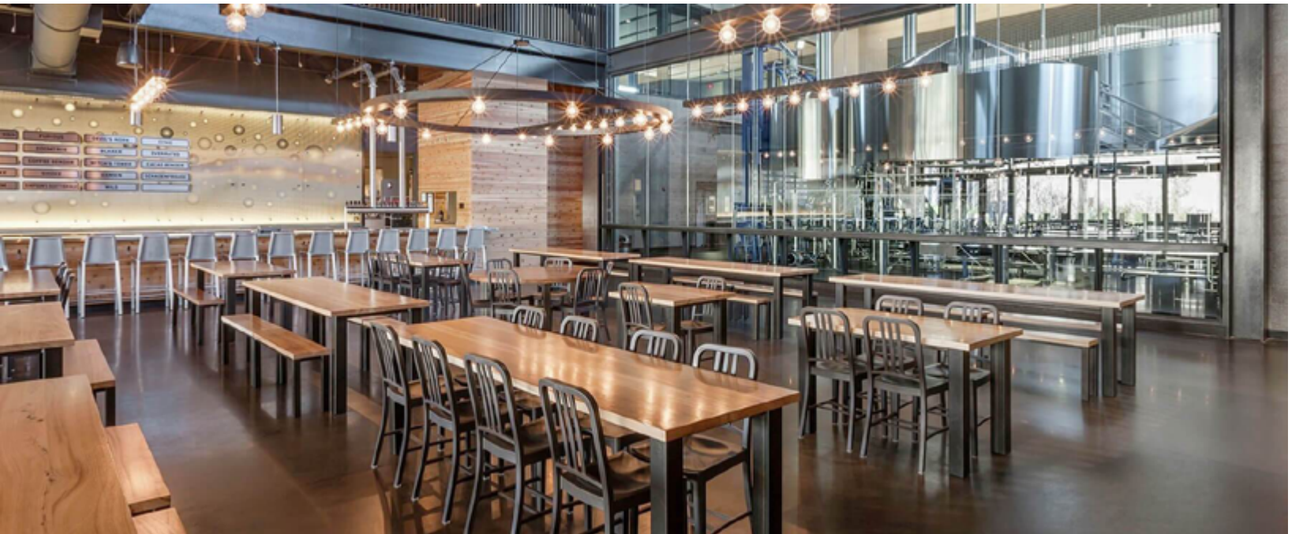
Combined, all three of the case studies are tackling separate typologies with separate issues, but are overall unified by the experiences that their customers have. Between open-air stadiums and arenas, they are used for different sports but have a general intention that is shared. From the entrance of the venue, the fans enter at specific checkpoints to maintain security standards. Afterwards, the circulation is primarily found in the concourse to either get to the seats, concessions, or restrooms. Following more recent trends, however, the stadia are beginning to add premium seating outside of the suite levels to accommodate different levels of luxury, cost, and environments. Often what can be seen now are lounges and bars being added on to the back of seating sections and servicing only those areas to create sub-experiences within the general bowl seats. Alongside these sub-experiences, we see the increasing trend of adding in secondary spaces for fans to enjoy the game alongside their ticketed seat. It is no longer unusual to see fans walking around the stadium and site during the game to stretch and view the game from a new angle.

Along with this advancement of the fan experience, we also see a current desire for these stadia to integrate mixed-uses to maximize their revenue. Currently, most venues utilize their beer halls and team stores outside of game times to increase their revenue year round, but those two spaces consume an extremely small percentage of the overall square footage. Due to this shortcoming, many of the stadiums find themselves largely unused for a large majority of the year.

With that knowledge stated, we begin to see the differences in how arenas tackled this issue vs. how stadiums chose to pursue it. Due to the smaller footprint and overall square footage placed in an arena, many of these additional spaces had to be created as additions or renovations of existing spaces. In the case of renovation, these existing spaces would be relocated to a different area or Different building. Looking at the Target Center, both of these moves were executed to modernize the facility and elevate the game day experience. In the recent renovation proposal, multiple social lounges were proposed with the intention of utilizing the existing Minneapolis Skyway for the primary means of circulation in that area. Inside the Target Center itself, two of the new lounges were built directly near the entrances and lobbies in order to optimize the levels of traffic. These two lounges are also capable of converting into operational restaurants, helping give back even more of the Target Center to the city of Minneapolis. With this, the proposal also looked to add viewing areas into the arena and open up the atrium to see the circulation inside the arena to feel, hear, and smell the energy and atmosphere during game days and before/after games.

At the Banc of California Stadium, their experiences were built off of the climate of Los Angeles and the concepts of their fans. Using one of the primary examples in the safe-standing seats, designed by Gensler, Heineken, and the fans, goes to show that involving the community in the design yields positive results and gives people a place of belonging in a very public setting. As sports design continues forward, simple moves like this will help reinforce the commitment to the fans, bringing the loyal back to the stadium time and time again regardless of the quality of viewing at home. Not only did the supporters section satisfy this desire, but their premium spaces helped draw existing fans and new fans together back into the stadium. With the addition of The Fields LA, residents of Los Angeles will be drawn back to this site multiple times throughout the year, even if LAFC has no matches that day. Local residents will also be drawn back into the stadium itself due to its easy ability to convert from a soccer stadium into a concert venue, esports venue, or general purpose gathering space. Not only does that flexibility give the stadium larger profits, it also increases their visibility in the community and throughout the nation via televised broadcasts.

Finally, we see the CMX Theatre at the front of movie theatre designs. In a similar issue to the two sporting venues, they have been looking for extra amenities and design features to replicate the comfort of one's home to draw customers back in. This was done at CMX through oversized seating, improved food and beverage options, and self-service that gives you these concessions without ever having to leave your own seat. With how similar in design the new movie theatre is to a stadium suite, the proposal should have both typologies in mind to create a seamless conversion process. Using the movie theatre as one example, the general public is able to reclaim an even larger portion of the stadium during the many off-days.



Major Project Elements

- **Removable soccer pitch, stored away to expose an everyday turf field.**
- 20,000 seats, a capacity more on par with the needs for an MLS Stadium.
- **A hotel within the stadium, featuring rooms with direct views of the action.**
- A movie theatre that converts to a stadium suite level.
- A walkable green roof with views into the stadium.
- A large vomitory facing the subway station to create a physical and visual opening.
- Restaurants that convert to stadium clubs and concessions.
- **A large beer hall with daily usage that can also be used by the stadium.**
- A field level club, providing fans with a unique game day experience and view.
- Safe-standing seats, giving the supporters section a permanent home.
- Retractable seating sections to maximize the open space inside the stadium
- Wide, open-air staircase between the concourse and the playing field to maximize site circulation during off-days
- Rentable, flexible event spaces featuring sweeping views of the Boston Skyline

Figures 29-31

User/Client Description

Client Description

1. New England Revolution Soccer Club

Due to the funding of this project, one of the most important clients of the development is the MLS' New England Revolution. Owned by Robert Kraft, who also owns the NFL's New England Patriots, he is set on building a new stadium for the club close to the heart of Boston and has set a rough budget for $400 million. Being the primary funder of the project would lead to certain amenities being desired and created to best suit the Revolution. Since the Revolution have a recently constructed practice facility, the stadium's primary use for the team is to host their matches. These matches would occur 14 times per year, with possibilities for more matches in preseason and playoffs.

2. CMX Theaters

As a primary user of the stadium development during off-days, the CMX Theaters would serve as a movie theatre for over 300 days of any given year. Located a few floors above the field of play, the movie theatre will close and convert into a stadium suite level when the New England Revolution play. Due to the many similarities between the movie theatre and the stadium suite, the theatre should be able to convert in a matter of hours. With such a short conversion period, the amount of time that the space is capable of being used can be maximized for both parties.

3. Hotel Franchise

Unlike the Movie Theatre, the Hotel directly connected to the stadium is capable of being used every day of the year, regardless of what event might be happening in the stadium. Marketing toward sports fans who would be visiting Boston, there will be suites on one side of the hotel that open up directly toward the stadium with sweeping views. On the first and second floors of the hotel there is ample space for lounges that could be utilized by both the hotel patrons and the spectators there to attend a game.

User Description

1. New England Revolution Soccer Club

As the primary user of the field of play and status as a high level club in the United States, the Revolution require a high-quality pitch to play on. Since they are the only club that needs access to this pitch, it would be designed to be retracted and stored for the 300+ days during the year when they do not play. When the Revolution play, the access to the field will be restricted to the club players and staff while the stands will be restricted to ticketed attendees.

2. UMass Boston Soccer Clubs

As a secondary user of the stadium, a client who is capable of using the stadium along with the revolution would be the UMass Boston Soccer Club. Like the Revolution, they would likely use the retractable turf during their gamedays with the stadium serving as either a new home for the club or a secondary home. Due to their status as a sporting club, they would restrict access to the stadium to those with a ticket and would only allow players and staff on to the field during use.

3. Local Residents

Within the stadium development, the local residents will be the primary users of the movie theatre, restaurants, and office spaces. As the development continues to grow beyond the stadium itself, the complex will continue to serve as a proper front door to Widett Circle. This development is reinforced by the stadium's location between the Broadway MBTA Subway Station and the Widett Circle Development. The residents who live nearby are able to use the open grass field for athletic and recreational purposes. Due to its wide open layout, it is also capable of being used for farmer's markets or other leisurely events. These local residents will be the large majority of the fans who attend Revolution games or any other major events to happen in the stadium component.

4. Visitors to Boston

Primary users within the Hotel industry, the visitors to Boston will be the crowd targeted for the Hotel franchise. Like many sporting events, the stadium will have a group of fans who do not live in the Boston area and rely on hotels during their trip. Being directly connected to the stadium, the connected hotel has periods of time that make it the most attractive hotel in the nearby area. Along with the sport fans, the hotel is planned to be reserved by local nearby residents who have family come and visit the city. Due to the lack of other hotels in this area of South Boston, they are serving an area with little competition compared to other neighborhoods.

Figure 32

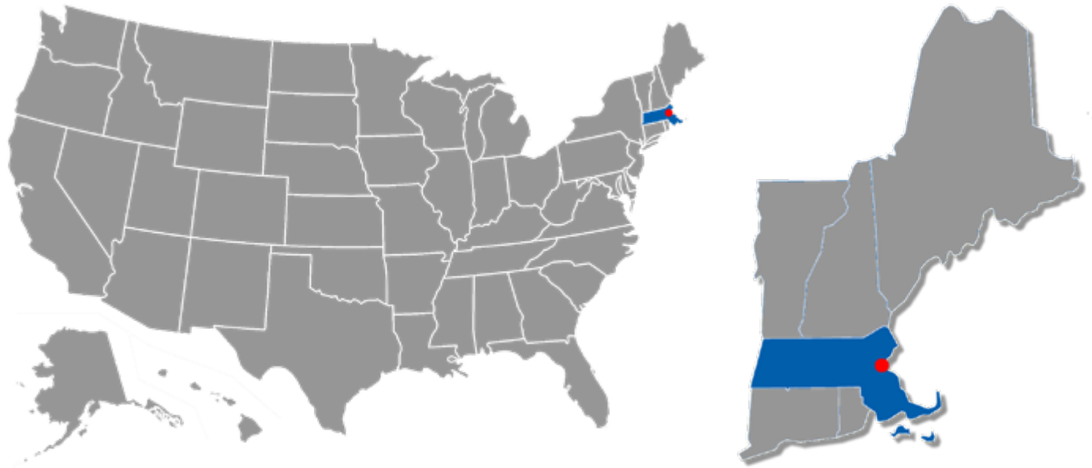
The Site

Widett Circle Railyard, Boston

Address: 200 Dorchester Ave, Boston, MA 02127
Size: 25 acres, new construction built on platforms

For years, the New England Revolution have been looking to build a new MLS Stadium in the Boston area. Currently, the Revolution play at Gillette Stadium in Foxborough, about 45 minutes outside of the core of Boston. At Gillette Stadium, they are the secondary user of the stadium behind the New England Patriots. Due to this status as a secondary tenant, they are interested in a new stadium where they are able to prioritize their schedule and have a stadium with a more appropriate capacity for their sport.

As stated by the team's owner Robert Kraft, the team is interested in their stadium being located closer to the heart of the city. In a city with limited land to build on, it is important to leave some space for design flexibility and additional spaces that might come. For the last few years, the Revolution have studied various sites and have not have satisfactory results. One of the sites that was given consideration, while having more than enough buildable land, is the Widett Circle area in South Boston. Due to the opportunities with the area, this has become the new site of focus.



Figures 33-35

Boston, Massachusetts

Located in the northeastern United States, the city of Boston is the capital of Massachusetts and the hub city of the New England region. As one of the oldest cities in the United States, Boston has always been synonymous with our nation's history. While it has successfully maintained much of its history, it has also been juxtaposed with some of the most modern architecture, being a home to many technological companies and businesses. The heart of Downtown Boston sits in the center of a peninsula of the Charles River, with most of the city spreading out radially from there. Boston's urban core has continued to grow west along the south side of the Charles River, spreading out into the Back Bay and Fenway Kenmore neighborhoods. In recent years as the land has become available for purchase, the South Boston neighborhood has seen a sort of renaissance with plentiful new construction bringing businesses and residents back into the neighborhood.

As a sports city, Boston has been known nationally to carry a passionate fan base behind all of their teams. Due to this devotion to their teams, Boston sports tickets have always been close to the top of the list of most expensive games to attend in their respective leagues. Knowing that there is already an existing fan base, the next important step for these sports facilities is to continue providing modern amenities and unique experiences that will bring the fans and tourists back to the venue.

Figure 36

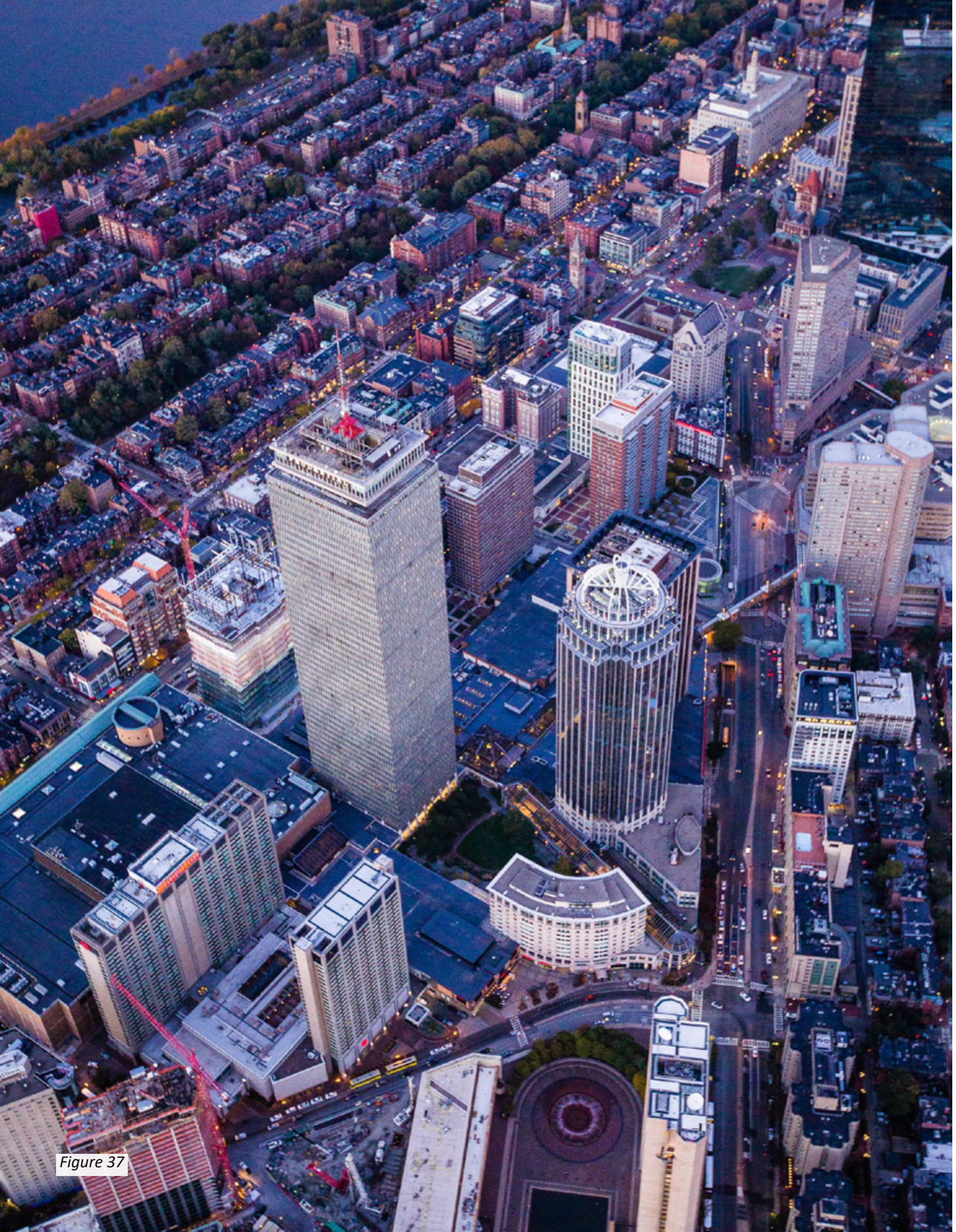


Figure 37

Project Emphasis

Description

Above all else, the project is aiming of emphasize the balance between sports design and mixed-use functions during its off days. As the New England Revolution will be the major source of funding, one of the two main priorities will be creating a state-of-the-art soccer stadium for their players and their fans. This new state of the art stadium, standing alone as the primary tenant, will help increase the presence of the New England Revolution within the Boston area.

Inversely, the second priority will be maximizing the space that can be converted from a secure stadium into an open public space. Part of this open public space will require a space that is widely walkable within different areas of the complex. To accommodate the security desires of the New England Revolution, team-specific areas of the stadium would be grouped together programatically and permanently secured to prevent the public from compromising their security.

In order to create a new state of the art soccer stadium, one of the major components would be the seating typologies that go inside the stadium. To create a stadium worth its value and bring a modern aspect to the city of Boston, the seating should follow the recent trends of soccer. One example of this trend would be the safe-standing seats. A typology new to American soccer, the seats allow fans the option to stand the entire game while protected by a railing in front of them. While not made for and desired by every fan, they have proven in multiple stadiums to be very successful for their die-hard supporter sections.

Like any other building typology, sustainability is a factor that should be considered. A recent movement in sports architecture has seen stadiums capable of landing LEED certifications anywhere between silver and platinum. In the case of this new stadium, with intertwining buildings and uses, the development would likely consider the option of pursuing a LEED Campus program.

Figure 38

Project Goals

1 **Create a stadium that can be truly beneficial to the public.** Many previous stadia with integrated uses have still left large percentages of their venues unused and underutilized for over 300+ days of the year. My goal is to experiment with solutions that could fix this issue.

2 **Successfully brand the New England Revolution in Boston.** Within the United States, Major League Soccer is still growing with most teams now having their own stadium. In order for the MLS to continue rising, clubs need their own stadiums to step them out from under the shadow of the NFL teams in their markets that they may share venues with.

3 **Set a new standard for Major League Soccer Stadiums.** For this to be done, innovation will be a key component of the stadium design aspect. Within the stadium itself, there needs to be design done to shorten the times in line, shorten the walking distances required, and create unique experiences that make a raving fan of every spectator who enters.

4 **Design a complex to LEED Gold or Platinum standards.** As we have been able to see through case studies and recently constructed stadia, LEED Gold or Platinum is a standard that is practical to achieve. Since this is a goal of the project that is being considered before the design begins, it should create a smoother process to move through.

5 **Have fun designing and researching the project.** With the classes being primarily online this year and social interaction with classmates being limited, ones mental health can be negatively impacted. With these difficulties, it is important to have fun with this project and not be weighed down by the stresses of school.

Figure 39

Project Plan for Proceeding

Description

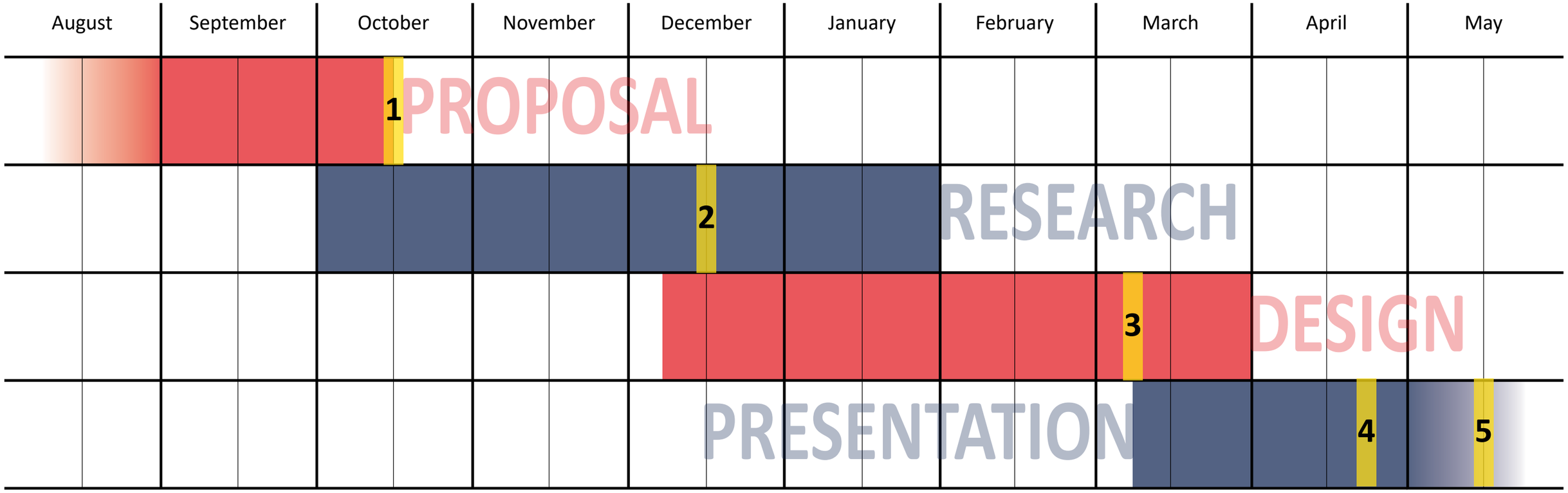
Before the designing of the complex begins, I believe that it would be greatly valuable to be able to visit the site in South Boston. If this visit is possible despite current travel restrictions in the United States, it will help create an understanding of an area that can not be given through Google Earth and Google Street View. Street views of the site do not paint the perfect picture regarding the adjacent surroundings and certain elevations and building heights that may come with it. The Internet is also not able to truly allow one to experience the climate, the sounds, and the atmosphere present in the area. Once all of these factors are documented and compiled, the next step would be to determine the specific needs for this site.

On the public side of the stadium, research will be utilized to see what types of businesses currently exist in the community. Using some of the historical data and recent proposal data from the city of Boston, it can be discovered what areas of the city are growing and how many jobs and/or residents are migrating into said areas. This information will be turned into rough sizings to create the massing of the surrounding developments and help clarify how many people will use the site throughout any given day. Paired with this, the information regarding the MBTA's Red Line that runs parallel to the site is readily available to provide commuting statistics.

On the athletic side, case studies, books, and articles will be vital to understanding the spatial requirements that are needed to be a top of the line facility. Once the requirements are understood, these spaces can be separated into public, private, and converted spaces. Using that knowledge, the amount of area that can be used by both the stadium and the public can be optimized. Sports design is unique in the sense that many of their successes are not judged through numbers, but instead by the human experience. As design trends have continued evolving, we have seen spaces created and fans responding very positively to them, leading us to replicate the concepts elsewhere. To start the conceptual design, case studies will play a critical role in seeing what components create successful social spaces and how much space is required to make them comfortable.

By using technologies like Revit, Rhino, and Adobe Products, this research will be able to be documented on the site itself which is capable of being translated into massing models. Once these masses have been created and the program has been placed, the program can be refined to best utilize the site. With the help of websites like CADmapper, full scale models of areas of the city of Boston can be created and used during the massing process to ensure that the masses fit properly on the site. Other aspects of the site like proper orientation, creating views of the skyline, and locating nearby transportation will prove to be more effective having a full scale model to work with.

Project Schedule



1. Proposal
The thesis proposal started with the brainstorming of ideas during the Spring 2020 Studio and will conclude with the submission of this document.

2. Program
The programming portion of the thesis was able to begin once the typology and site location were determined, which happened at the beginning of October.

Key Dates: **1** **Thesis Proposal due 10/13** **2** **Thesis Research due 12/17**

3. Design
The design phase should begin toward the end of the semester, around early to mid December after the heavy researching for the project has been done. It could also be pushed back a month to allow a site visit to happen before making design decisions.

4. Presentation
The programming portion of the thesis was able to begin once the typology and site location were determined, which happened at the beginning of October.

Key Dates: **3** **Midsemester Review 3/8** **4** **Exhibit due 4/23** **5** **Book due 5/14**

Thesis Research

Figure 40

Literature Review

Stadia: A Design and Development Guide

Hotel Design, Planning, and Development

Figure 41

Stadia: A Design and Development Guide

Introduction

Starting the initial research, case studies proved to be beneficial in understanding what the typical features of a soccer-specific stadium are as well as other sporting facilities. Like every stadium that has proceeded, the majority of the seating bowl consists of a standard, folding seat with a built in cupholder on the back side of the seat. In most modern stadiums, the seating bowl is divided into two bowls with a level of premium seating typically placed between the two bowls. Behind the seating sections is the concourse which is where the entry points, concessions, and restrooms. Underneath the concourses lies the event or field level, which is recently designed as the space that is home to the office spaces and team spaces, locker rooms, athletic training facilities, operational facilities, and storage spaces.

Within the last ten years or so, there has been an increase in sporting teams seeking to add in fan clubs, lounges, and seats onto the event level as well for premium seating directly adjacent to the action. Because of this, designers have to include extra security measures to ensure that the athletes and sporting clubs have their areas separated from the public areas. Generally, this will lead to the event level being split into a public and private area. This thought experiment of a public vs. private level leads to a larger question of what stadium parts are able to be public vs. private vs. convertible between the two. To make this experiment a reality, it is necessary to utilize case studies that have floor plans and diagrams highlighting how the spaces are generally laid out.

Review of Literature

Before diving into all of the logistics that create a stadium design, there is a need to establish baseline information about the stadiums: how they were originally designed, and what their design has evolved into over the course of centuries. In the first chapter of the book, the history of the stadium is written out, starting with the ancient Greek design for a venue to host their Olympic games and other sporting events. In one of the first designs dating back to the Ancient Greeks, the stadium was designed in a similar fashion to a Greek theater with the stadium being cut out of the hillside to provide a natural seating area and clear sights to the field of play (John & Sheard, 2000.) From there, the concept was turned into a standalone stadium, built on flat ground but constructed with a seating area with a similar sloped proposal. One of the first examples that is provided is the Panathenaic Stadium located in Athens, Greece. Originally built around 331 BC, the stadium had a capacity of 50,000 seats and is the only stadium in the world to be built entirely out of marble. Although the stadium fell into a state of disrepair over time, it was restored in 1896 to serve as the home for the first modern Olympic Games and hosted many of the events (Cardinal, 2016.) Looking at the stadium's history, it was a venue that was primarily intended to host track and field events.

As shown in the correlating figure below, the track configuration created a seating bowl in the stadium that had a very narrow and elongated u-shape. Based on the floor plan and sections, it is also shown that the seating bowl is divided into two portions by a circulation walkway that is accessed through stairways and vomitories leading to the ground level. The floor plan also highlights the points where staircases are located for spectators to easily access their seats and move up and down the stadium. Like the modern stadia, the entrances used by the public spectators and the judges were two separate entries due to their need to access separate spaces. This form over time was adjusted to widen out the u-shape of the bowl to accommodate larger fields of play for events like football and soccer. Even today we see stadiums that have been designed using this basic shape, two of the notable examples being the Memorial Coliseum and the Rose Bowl both located in Los Angeles, California.

Figure 42

> *"The stadium as a building type saw a revival after the industrial revolution. There was a growing demand for mass spectator events from the public, there were entrepreneurs who wished to cater for this demand and there were new structural technologies to facilitate the construction of stadia or enclosed halls. A particularly important impetus came from the revival of the Olympic tradition at the end of the nineteenth century." (John & Sheard, 2000.)*

The beginning of the modern Olympic stadium typology that we now know today began with the 1894 Olympic games held in Athens, as previously mentioned in the book. To make this game happen, the old ancient Greek stadium was rebuilt to its former glory and was capable of hosting 50,000 people at the first games (John & Sheard, 2000.) During the twentieth century, this led to the latest technology within stadium design being used to create the next biggest and greatest Olympic stadium. As these stadiums only got larger, they were more capable of holding a larger spectator capacity. This increase in size also led to stadiums having a larger field of play that could accommodate multiple sporting events, track and field included, to create very practical venues. However, around the mid-twentieth century there was a shift in mentalities from an all-in-one stadium to instead having "a decentralized plan… with the athletics stadium in one part of the city and other facilities some distance away on the urban outskirts." (John & Sheard, 2000.)

For example, football teams and baseball teams originally built their own stadiums due to the significant difference in the field dimensions between a rectangular football field and a baseball field. However, after World War II, there was a shift in the typology looked to become multi-purpose facilities in many cases designed with a roof, and designed outside of the city's urban core built in the center of expansive parking lots. This trend did not prove to be a lasting design solution, as there is only one venue with this idea, this venue being the Oakland Coliseum in Oakland, California (John & Sheard, 2000.) Once that proved to no longer be a viable method for the future of the sporting teams, we saw the rise in single-sport facilities again, often built close together like what is seen in Kansas City. There, the football stadium and baseball stadium are built adjacent to each other and share a parking lot in the suburbs of town. Considering that theses venues were built in the 1970s and are still being used every season, they have undergone multiple renovations in order to stay at a high standard for both the players and the spectators. Renovations include seat replacements, addition of premium seating and bars, upgrading fan amenities, and other small facility maintenance projects.

As the book begins to suggest, the sporting clubs of the future have been exploring the possibility of being their own developer through the renting of commercial spaces on their land or inside of their stadiums. "Good management can increase revenue by exploiting each part of the

facility for more than one purpose, a strategy sometimes referred to as ‘multi-use’ but actually just a matter of maximizing the return from investment” (John & Sheard, 2000). Looking at the table below, it is first worth noting that the spaces in the stadium have been divided into three areas. The playing area, used for sports but capable of hosting concerts and other sports, is a multi-purpose use that has been done for quite some time now. More recently however we have started seeing the support facilities becoming spaces that can be redesigned to serve as public spaces during off days. One example of this would be a Beer Hall that is wedged between the main concourse and the building’s exterior. This allows the space to be accessed during a game by any fan walking by and for customers to enter on off-days to grab a bite to eat or watch a different game. The other support facilities that exist in this table are capable of being rented out as well to other businesses or the general public to provide the stadium with extra revenue. To go with this, the additional facilities like hotels and retail are capable of being added on to the side of stadiums to gain extra revenues on a year-round basis as opposed to a periodic span like sporting seasons. With the current coronavirus pandemic, we are beginning to see a decline in the retail space itself as well as many public gathering spaces. While it is still uncertain if they will make a rebound after the pandemic is over, any retail space around a stadium would be best designed if they were either directly related to the sporting team in question or designed for flexibility. One could assume that sports retail, such as team stores, will rebound when the stadiums are filled with spectators again due to many fans stopping in during a game to look at team merchandise.

Looking at the diagrams to the right, the top shows one example of how a standard stadium suite is capable of being converted for rentable use. In this instance, the suite is converted into a hotel room. Similar to the stadium suite, the design shown is a suite with seating both outside and inside of the room, a personal bathroom, and a storage closet. The two seating options allow the spectator to either be directly engaged with the rest of the stadium or remain inside a climate-controlled environment separate from the action. With this, the indoor seating is also able to be removed to instead accommodate a bed up to a king size. The design shows that the conversion is relatively easy and practical, with the given that there is extra storage space outside of the suites where either the beds or the tables and chairs can be stored when not in use.

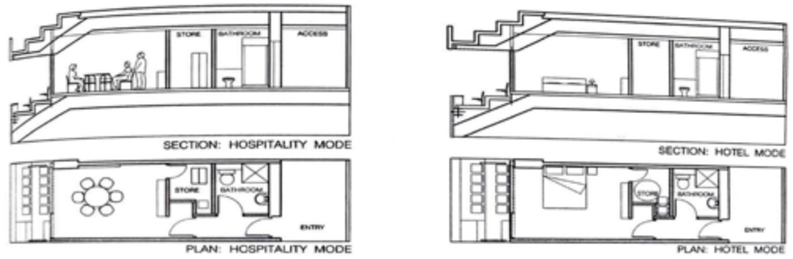
Table 1.2 Possible multi-purpose uses of sports stadia

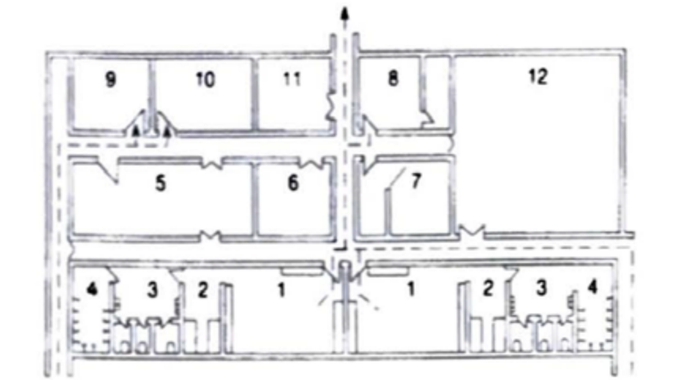
Playing area		*Support facilities*		*Additional facilities*	
Primary	*Secondary*	*Primary*	*Secondary*	*Primary*	*Secondary*
Football	Concerts	Restaurant	Banquets	Health club	Offices
Tennis	Conventions	Bar	Parties	Other sports	Retail
Rugby	Exhibitions	Private box	Meetings	Hotel	Cinemas
Cricket	Other sports	Lounges	Conventions	Sports retail	Residential

Note: The above are only broad indications of options to be investigated. For actual design it will be necessary to undertake detailed studies using specialist advisers.

Figure 43

Featured below is a diagram from FIFA/UEFA with a recommended layout for a soccer stadium on the event level where game day functions are held. Importantly, the diagram highlights the primary circulation paths taken by both the media and the team within the space. To help with security measures, the media and the team have separate entries to protect the players as they go from the outside of the stadium to the field of play. While both are necessary programs to make the game happen, they have different security clearances and both are not meant to be accessed by the general public. The diagram shows two team spaces, for the home team and visiting team, equipped with dressing rooms, therapy spaces, restrooms, and showers.





Key

1. Team dressing rooms
2. Massage area
3. Toilets
4. Showers
5. Equipment area
6. Medical examination room
7. Dope testing room
8. Match officials' dressing rooms
9. Press interview room
10. Media room
11. Match delegates' room
12. Warm-up area and gymnasium

Figures 44-45

Hotel Design, Planning, and Development

Introduction

As a book, Hotel Design, Planning, and Development covers most of the information regarding hotels that an architect would need to know. Starting with an overview, the first chapter provides a general overview on how Hotels have evolved, how they have varied, and what considerations have been added into the designs over time.

The book proves to be useful as well as long as certain predesign criteria and site criteria are known. Based on what sort of environment the proposed hotel is located in, the book can refer one to a chapter on hotels in a downtown area, suburban area or along the beach. Along with this, it can be important to know whether this hotel is for a conference, luxury, extended-stay, casino, or mixed-use. While the room that somebody stays in while they use this hotel might not be subject to great levels of variation, the ground levels where the unique programs lie can see great levels of variation in both their function, square footage, and the arrangement of spaces.

With this information being established, the book can now be utilized to help with design considerations for the thesis site. The baseline information that is necessary to know before using the book is that the Hotel will be located in an urban setting and it will likely have mixed-use components due to its location within a new development. Other potential considerations would be designing to hold a conference and designing to have extended-stay rooms. Through a quick google search, it appears that almost all of the extended-stay hotels in the Boston area are located on the suburbs with none being located in the city's urban core. To best design the hotel and take the best considerations into use, the chapters that are related to those specific hotel elements will be read through and will analyze the applicable diagrams.

Review of Literature

As said early within the development and planning considerations, "the location of a hotel in the city in many ways defines its market and its character." (Rutes, 2001.) Knowing this, one can see the visible trend that the hotels in a city tend to be built around the active shopping districts and centers of business. One of the prime examples of this would be in Chicago, where many hotels are located within the Magnificent Mile. Besides shopping districts and areas of business, hotels can be attracted to areas in a city with a close proximity to colleges, government centers, medical centers, or any other place of significance. With the site in South Boston, there is currently no major place of significance within the area that would attract a large number of hotels. However, an argument can be made that a stadium can be considered a place of significance within a city, providing a justification to build a new hotel in the area to accommodate the people who come to visit. It is likely that a hotel located close to a stadium would be tailored more toward the assumed primary demographic of a visiting sports fan. To do so would include some level of relationship with the stadium and the respective teams that would call it home, whether that relationship be visual or physical.

The first design referenced, the W Hotel in San Francisco, was designed in a dense, urban setting suited to accommodate both tourists and businesses. According to the book, the hotel's shape was dictated by its direct adjacency to the Moscone Center and the San Francisco Museum of Modern Art. Because both of these buildings are landmarks in San Francisco, it was important to the city that the sight lines of these two venues would not be encroached upon. To make up for this issue, the hotel's three story podium was maintained to give the building a clear prominence within its urban context without overpowering the historic elements that surround it. Regardless of what typology a new building may be, designing to best fit in with its context will lead to a successful urban design approach. Many cities, especially outside of the neighborhoods where high rise buildings are constructed, will have zoning codes that require setbacks from the street to maintain the open-air environment.

Looking at the ground level plan for the hotel, the most noticeable feature is the octagonally shaped main entry into the building. Once in this atrium, the visitor can either continue walking forward to the café/lobby bar, turn left to access the restaurant, or make a right and walk through the living room to access the hotel lobby and elevators. Per code requirements, there are staircases for egress that are on each of the four corners of the building as well. As one would expect, the kitchen is placed close to the restaurant for easy transportation of the food and beverages. Along with this, the kitchen is placed very close to the café/lobby bar to service the culinary needs of that space as well. The hotel has a relatively typical back of house space, consisting of a loading dock that leads to the purchasing/receiving area. The purchasing/receiving area, to get the delivered

items where they need to be, is located adjacent to the kitchen and office with a close walk to the freight elevator. Looking at the plan, it appears that the hotel has 2-3 freight elevators, one of which is larger than a standard elevator to help handle larger furniture that has to make its way into the rooms.

Based on the third level plan, it is clear that the hotel was designed to hold conferences and other large-scale meetings. Looking at the plan, it doesn't appear that a hotel with conference-hosting capability takes a significantly larger footprint than what a standard hotel may use in a similar site. According to the ground level plan, the circulation path for those attending a conference in the W Hotel would start at the main entry and continue up to the third floor via the large staircase to the left of the entry. Along with the primary staircase, the elevators lead to a central circulation area in between the meeting rooms. Both the meeting rooms and ballrooms are simple rectangularly shaped rooms, designed primarily to be spaces that are flexible and capable of rearrangement. If they are similar to other conference centers, some of, if not all, of the ballrooms will have multiple entries to allow for a partition to divide the space if there is a need for more rooms.

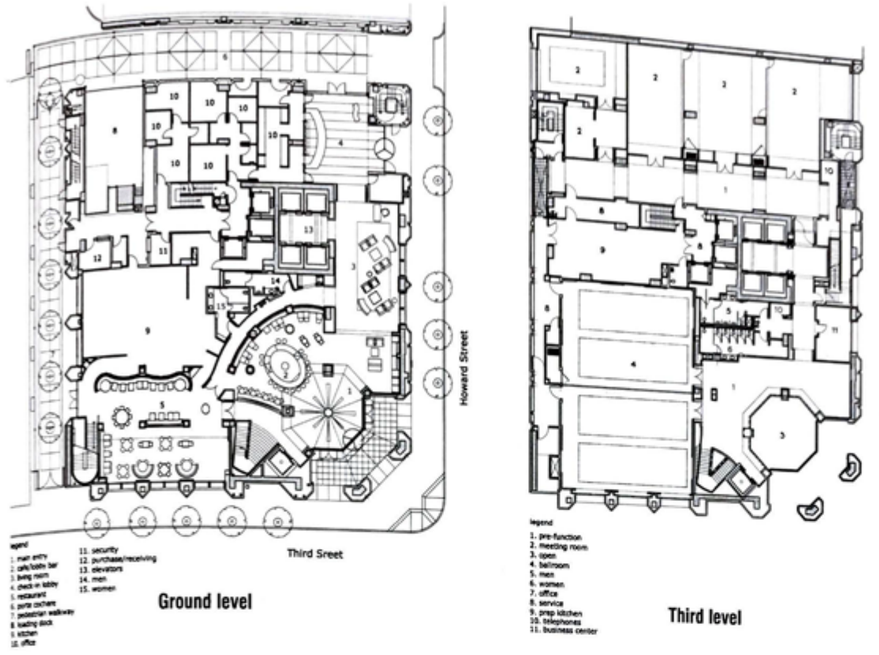


Figure 46

Related to the site in question in Boston, this diagram is beneficial in understanding where the hotel will need to be on the site to best make it work. In the case of the W Hotel, it is surrounded on all four sides by either streets, pedestrian walkways, or a driveway. While the street on the south is not absolutely necessary for the hotel, the driveway to the north and the street on the east are essential in establishing points of entry for both pedestrians and vehicles. Initially considering where the hotel will be on site, it will most likely be attached directly to one end of the stadium, which would only allow for three out of the four sides to be utilized for circulation. There is little need in Boston for additional hotels for conferences, leaving the second and third floors open to new designs to fill that space. To cater to the sports fans that would occupy the hotel on gamedays, a sports bar and restaurant that opens up to the stadium concourse could bring in more people to the hotel and provide extra revenue to the owners. On non-game days, the restaurant would still be able to service the hotel. To best make it accessible from the lobby, a large, open staircase would be beneficial as well as an atrium space that makes it clearly visible from the entrance.

Looking at the mentioned floor plans to the right, they both show examples of how hotel corridors can be typically laid out. In this instance, both of the plans show a double loaded corridor with hotel rooms on either side. On either end of the corridor in both diagrams are egress stairs to satisfy the needs of egress. The core that is composed of elevators and freight elevators is placed in the center of the building, which seems to be typical for a hotel. Similar to a standard hotel room, the rooms are elongated perpendicular to the corridor to maximize the potential number of rooms that could be on each floor. In the case of the thesis proposal, the hotel rooms should not deviate much in design from what has already been done previously. While the hotel rooms can't be intertwined with the stadium physically, it is possible to tie them together visually through views from the room. This also provides an opportunity to create unique hotel rooms that create a floor plan tailored to viewing the game from the room as opposed to physically sitting in the stadium.

Figure 47

Literature Review Summary

Between both the stadium and hotel literature, one of the important aspects that helped define the literature were the diagrams that show sample layouts of significant spaces between the two typologies. Inherently, Stadiums can be a complicated building typology. While many of them in reality may lay out their event level programs in very similar fashions, this could be attributed to the fact that there are not a lot of architecture firms that do large-scale stadiums. Because of this, the few firms that do design these buildings may reuse portions of their own previously designed programs and place them in a new facility in the exact same spot in their relation to the field of play, tunnels, or vomitory.

Along with this situation, it also is not common to be able to do a google search and find a floor plan of any given stadium. In fact, during the research component of the thesis proposal there was an inability to find a floor plan for a soccer-specific stadium that is primarily utilized by a Major League Soccer team. While there were some floor plans for stadiums that primarily host football and secondarily host soccer, none were available that had soccer as the primary host. Especially with how many new soccer stadiums are being constructed, there is a lower chance to find the plans. With the lack of a plan, the design and development guide was beneficial to locate spaces that otherwise would not have been accounted for. There are even some of the smaller level rooms, such as drug testing rooms and spaces for officials, are relatively small in the scale of things but overall vital to making sure that the games are able to operate as smooth as possible. Even before the seating and grandstands are designed, the book helps to show the typical size of a soccer pitch and identify small elements that are necessary around the field like safety margins. The safety margins are necessary to ensure that any build infrastructure would not be too close to the field and potential harm a player and helps keep the fans and other support staff on the field level a safe distance away.

Along with other books, these diagrams are able to be compiled to create a clear picture. As the designing starts next semester, the diagrams that come from the book will assist in the creation of the field of play, seating bowl, event level, and back of house spaces. Some of the service spaces like concession stands, restrooms, lounges, and team stores tend to be present on very rough navigation plans and can be found for most stadiums. These navigation plans often highlight a few of the public areas and spaces that are considered necessary for the spectators who would attend a game. While not detailed like any level of a floor plan, they do help create some rough spatial layout equivalent to a bubble diagram.

Regarding the design of hotels, many hotels do not have floor plans that are publicly available either. While you may be able to find some floor plans of hotels, many of them will show up on a google search due to them being submitted for some level of award or to be featured on an architecture website like ArchDaily. Even when those hotels are public, they are typically local hotels at a smaller scale in an urban setting that sought to accomplish something unique and fresh. The larger hotel chains, like Marriott, Hyatt, Embassy Suites, typically keep their plans reserved since they may copy and paste their designs into a new setting. Knowing this complication, the hotel literature became important in hopes to understand what happens inside of a hotel that may be at a larger scale than 5-6 stories.

In the case of the available case study that was found in the book, it was built in an urban center and is capable of hosting conferences. However, there is not enough space present to allow for it to host conventions. While not shown in the literature review, the book provided a section cut along with the floor plans to show how tall the hotel is and highlight how all of the hotel program stacks up and comes together. Knowing what spaces the hotel needs will be beneficial as the design process starts next semester. The book can help establish what sort of hotel will be placed on the site and from there can help detail out what spaces will typically come with that. Being that the intention would be to intertwine the hotel with the stadium, there will likely be some modifications made to connect the two and the second/third semi public levels will deviate slightly from what has been done before.

Figure 48

Project Justification

From both a professional and personal perspective, I believe there are many justifications that made this project valuable for me to study. A majority of the reasons listed revolve around the spectator, who is the primary driver behind the changes that happen within sports design.

1. The Sports Stadium is constantly evolving.
Over the course of the last 50 years, we have seen large changes in what we view as the stadium's priority. Previously, it was a main desire that the stadiums could be shared my multiple professional teams in order to maximize the use of the facility. Afterwards, the shift was made to prioritize sight lines in the stadium, leading us back to teams having their own facilities for their respective sport. More recently, the trend has seen stadiums looking for ways to integrate seats that are far more than the standard stadium seat.

2. A majority of stadiums are still backed by public funds, but with little benefit to every resident.
After looking at some cities like Minneapolis/St. Paul, we see instances where cities have spent up to $1 Billion on stadiums. While the public funds were fueled by tourism, it is easy to argue that those funds would be better spend on municipal projects that would be able to be more widely used by the average resident. If the stadiums are utilizing public funds, the public should able to use the venues in a limited capacity even when no event is being held.

3. The project can serve as a valuable experiment for future stadium design.
The thesis proposal will aim to create a stadium that could theoretically function as a public space when not being used by sports. Currently, there are no sporting venues that open up their fields of play and seating bowls to the public, with the exception of guided tours. Through experimentation, it can be discovered whether this is feasible, and how to maintain security in the team spaces and private areas.

4. The typology is more focused around the spectator than ever.
As shown by COVID-19, the sporting events will go on regardless of the fan's presence in the stadiums. While they are not needed, it is mutually beneficial to both the athlete and the fan. To bring the fans back to the stadiums, there need to be amenities that can equal or be better than the experience one has at home. Recently, the trends have shown spaces like lounges, outdoor patios, and club areas as main design decisions that can be made to increase attendance and revenue at the stadium.

5. There are existing funds to make the project a reality.
The New England Revolution's owner in Robert Kraft, who would serve as the primary funder for the new MLS Stadium, has openly said that the team is willing to spend $400 million on a new stadium in the heart of Boston. However, like in the case of many stadiums, it is possible to gather some public funding if there are areas that the city could justify acquiring.

Figure 49

Thesis Context

History of Soccer-Specific Stadiums

Earlier during the literature review, the history of sports stadium design dating from the Ancient Greek and Roman days up to the modern Olympic games was covered. However, the sports stadium design that has not yet been covered and serves as important context would be the history of soccer-specific stadiums, particularly within the United States. The primary league of soccer in the United States, Major League Soccer, was founded in 1993 and started with 10 teams playing in front of small crowds (Schneider, 2020.) It wasn't until six years later in 1999 when the first MLS team built their own soccer-specific stadium. As of 2020, there are seven stadiums under construction for existing or soon-to-be Major League Soccer franchises. A far cry from the other major American sporting leagues, the new soccer stadiums are primarily privately financed with their respective clubs footing the bill. Typically, the public's portion of the financing comes in the form of new infrastructure or a need for it to be modernized (Schneider, 2020.)

In the New York Times article, *As Major League Soccer Expands, Teams Are Getting New Homes*, the city of St. Louis, Missouri was used as an example to show how the soccer stadiums have been financed in a significantly different manner. Back in the early 1990's, St. Louis attracted the Rams by using roughly $250 Million in public funds to build the Edward Jones Dome. Despite investing this level of money into a stadium for them, the Rams only lasted in the city for only 20 years. Even after the team had relocated, the city was still left with yearly payments on a dome, which at this point in time now sat dated and without a major tenant. However, when St. Louis looked to attract an MLS Franchise, they were able to do so with a proposed $300+ Million in private funds to construct a soccer-specific stadium. While the team could have used the Edward Jones Dome as a new home, it is far larger than what is needed for an MLS team and would have cost a large chunk of money regardless to renovate it to MLS standards.

Similar to all other major franchises, the MLS seeks out franchises that have their own specific stadium. While this was not a standard when the league first began, the MLS has seen a national increase in popularity which has led to a desire to design and build specific stadiums that are capable of meeting their newfound needs. There are a few old franchises, like the Chicago Fire and the New England Revolution, who still occupy an NFL stadium as their primary home. If they wish to stay competitive in respect to other franchises in the league, a new stadium built with them as the first priority will benefit them greatly in the long run.

Figure 50

Site Introduction

Located in the heart of South Boston, the development area has existed for years as a railyard for the Massachusetts Bay Transportation Authority (MBTA), the local government agency who owns a large majority of the site's land. The development area itself is composed of two portions, the Cabot Yards area on the north and the Widett Circle area directly south of that. These two areas together will be referred to as the railyard area. The railyard area is surrounded on the west end by Interstate 93 and the access road, to the north by Fourth Street, to the east by Dorchester Avenue, and to the south by the Boston Bypass. As partially seen in the figure to the left, Interstate 93 as well as its spurs and frontage roads combine and stack together to create some level of a wall that blocks in the western half of the site both acoustically and visually. Considering how busy the Interstate can be toward the heart of Downtown Boston, sound that comes from vehicles driving past will be a consideration on the site if there is a desire for a relatively quiet outdoor area nearby. The site is currently split in half by the large set of rail tracks that are used by Amtrak and the MBTA for their Commuter Rails and by the Red Line Subway for maintenance and inspection purposes. One block north of the intersection of Fourth and Dorchester is the MBTA Red Line's Broadway Station. One station north of the Broadway Station is the South Station, hub to half of Boston's regional and commuter rails. Considering how close to the core of downtown the site is located as well as the ocean, there will be many geographic, social, and urban contexts to consider as the site analysis continues.

Historically, the site has had very little movement over its more recent lifetime. According to Google Earth imagery, dating back to 1995, the site and the buildings that exist there have remained relatively the same, give or take a few renovations. As Boston had grown, the city never abandoned Widett Circle as a hub for transportation and their respective maintenance facilities. Through images, it is apparent that the neighborhoods surrounding the railyard area have continued developing throughout the history of the city and we now see South Boston having a resurgence in development as Boston continues to grow and densify in its urban core. Naturally, the urban core developing and having little land to do so has led to a continued interest in developing the railyard area to accommodate the growing needs. However, due to its consistent multi-ownership and complex facilities, these developments have not come to fruition. Most recently, the area was proposed to serve as an anchor for the Boston 2024 Olympic games bid, which proved to be unsuccessful after not gaining much traction.

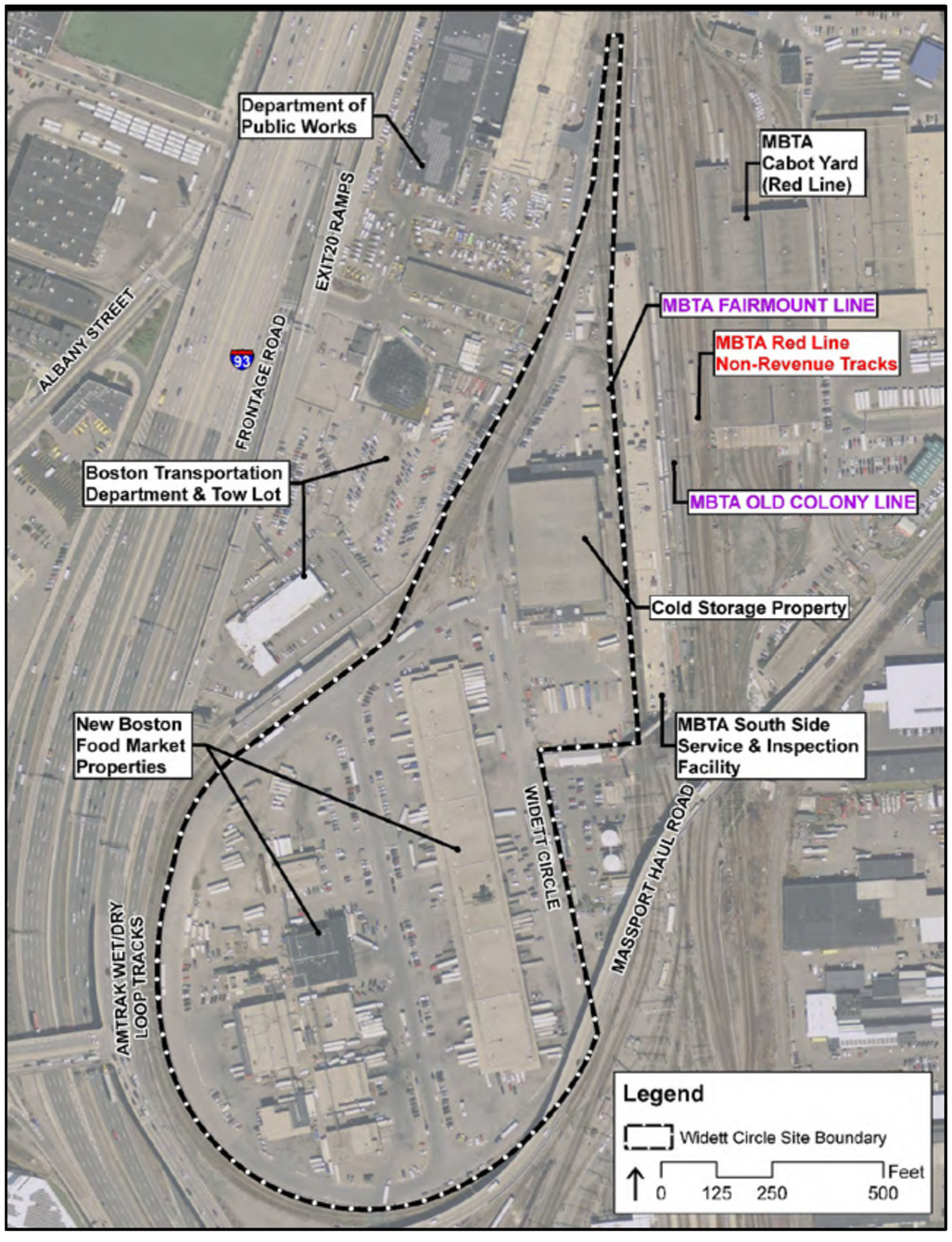


Figure 51

Existing Site Conditions

As previously mentioned, the current sites have multiple buildings that have ownership in different private institution as well as local and state government agencies. Within the Widett Circle site boundary that is shown on the figure to the left, that site is completely privately owned with the ownership split between two different people. The New Boston Food Market Properties lot was sold to new ownership around the end of 2019 with the intention of acquiring more space to built up the area beyond 2020.

Looking at the Cabot Yards area of the site, it is almost entirely publicly owned. The City of Boston owns the land of the left half of the Widett Circle area, home to their Department of Public Works and the city's Tow Lot. Currently, the city is looking to sell that 18 acres of land to a private developer, but the plan to sell has been on hold as of recently. On the other side of the property line is property primarily owned by the MBTA. Two of the system's commuter lines, a non-revenue subway line, an inspection facility, and a maintenance facility are present on this land. According to the city as well as the MBTA's Facilities Master Plan, the MBTA has no intention of moving their operations away from Cabot Yard any time soon in the foreseeable future.

Figure 52

Figures 53-54

2024 Boston Olympics Bid

Looking back to the year 2012, the city of Boston had investigated the feasibility of hosting the 2024 Olympic games. As traction picked up for the city to host, they began looking into the building of temporary facilities for aquatic events, championship games, and track that could be removed or demolished at the end of the games. (Clauss, 2015.) As this research continued, the city landed on a solution to build an Olympic Stadium on top of the area currently known as WIdett Circle that could host the large events of the Olympics. The proposal called for the construction of a temporary stadium paired with the building of infrastructure and other mixed use developments that would fill this area out. When the games would conclude, the idea was that the stadium would be demolished and be replaced with a large public park conveniently in the center of their new Midtown Boston through a multiple phase plan.

In 2015, the city of Boston decided to terminate its bid for the 2024 Olympics games. With that decision, the city was left with billions of dollars saved in construction costs and a few concepts of how the city could have grown. Even though the Olympic stadium proposal died with the Olympic bid, many Bostonians were still intrigued by the concept of developing the WIdett Circle area to become a new Midtown. While this idea had some steam in 2015, the passing fancy slowly faded as the land was not up for sale at the time.

It wasn't until 2018, when the New Boston Food Market put its Widett Circle lot up for sale, that this idea again gained traction. Along with the New Boston Food Market, the city had considerations of selling its existing Tow Lot to the north, effectively putting half of the building area in the midtown up for sale. Along with many locations in the urban core of Boston, this area was thrown around as a potential site for a new stadium for the New England Revolution. While many sites had their own respective merits, this site became popular due to its centralized location, interstate adjacency, and proximity to public transportation like the MBTA Red Line. Even though the 2024 Olympic Games bid has long faded in the memories of Bostonians, the design ideas that would have developed a bustling midtown have stayed fresh in the minds of developers and planners.

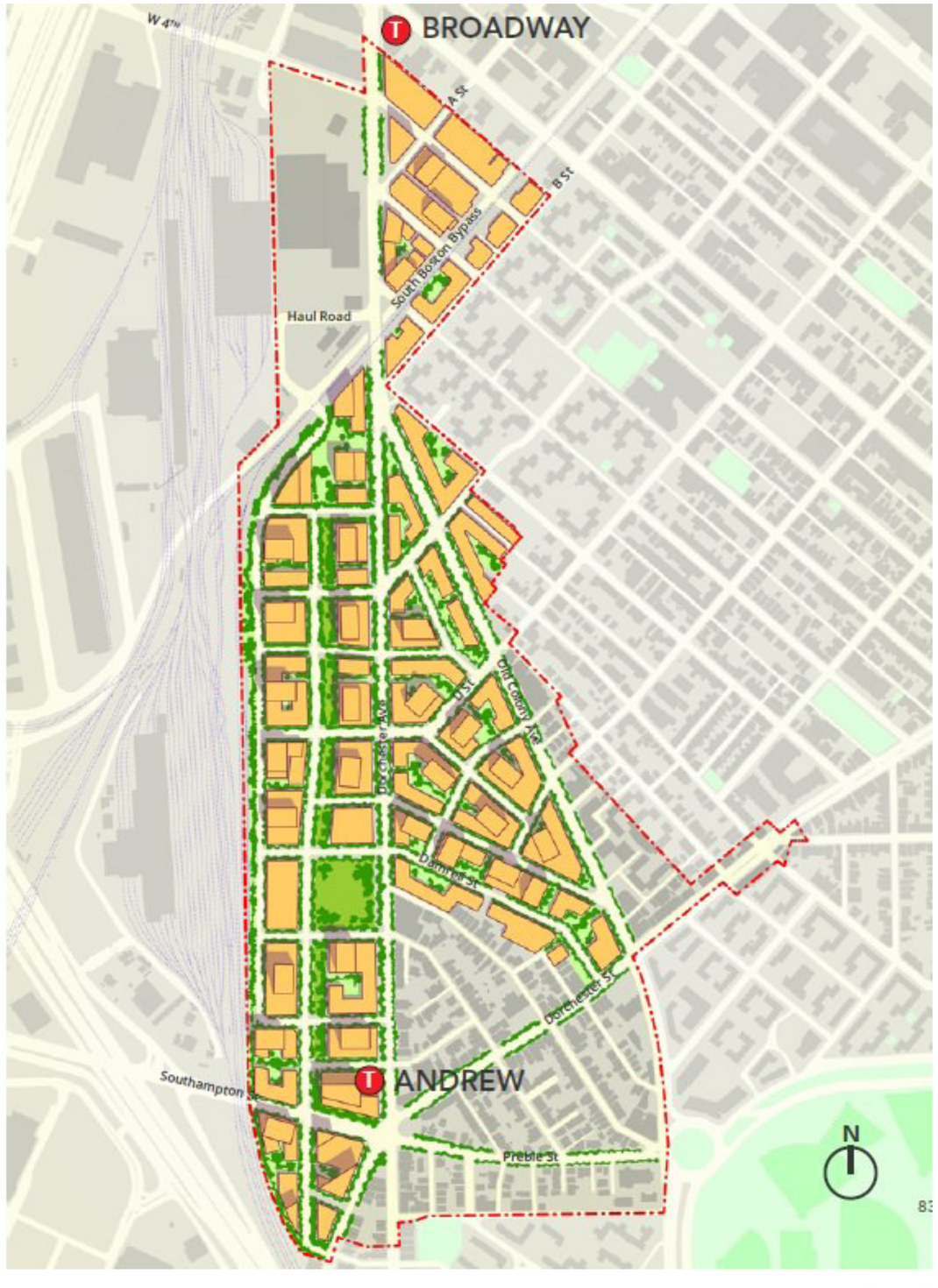


Figure 55

Nearby Dorchester Avenue Redevelopment

Looking at the figure to the left, the figure shows proposed development in the future that would occur near the site in Boston. The site exists opposite the northern triangle of development on Dorchester Avenue. Situated between the two MBTA Red Line stations of Broadway and Andrew, the existing area is primarily home to low rise residential buildings to the east of Dorchester Avenue and industrial buildings to the west along the train tracks.

Based on the planning shown, most of the future development in the area is geared toward office spaces and high rise residential buildings. Due to the ever growing need for housing in Boston and the growing lack of places to build them, areas like South Boston are now finding themselves as the new home for urban design proposals in the city. Within this proposal, keeping with current design and development trends, it is likely that the residential buildings would include some mixed use spaces on the ground levels. With this large influx of apartment units coming to the neighborhood, it would be necessary for the mixed use spaces to include restaurants and shops to accommodate the new residents and their needs. Even as the number of restaurants grows, it would benefit the community to have entertainment areas and ample green space for recreation.

Looking more at the Dorchester Avenue Development, there are a few avenues that align with the southern end of the Widett Circle Development. By connecting the two developments, the growing hub of South Boston would be well connected and result in increased walkability, transit options, and neighborhood amenities. Similar to areas on the proposed site of the thesis project, the connection between the two could be built and expanded through the use of decking that spans above the existing train tracks.

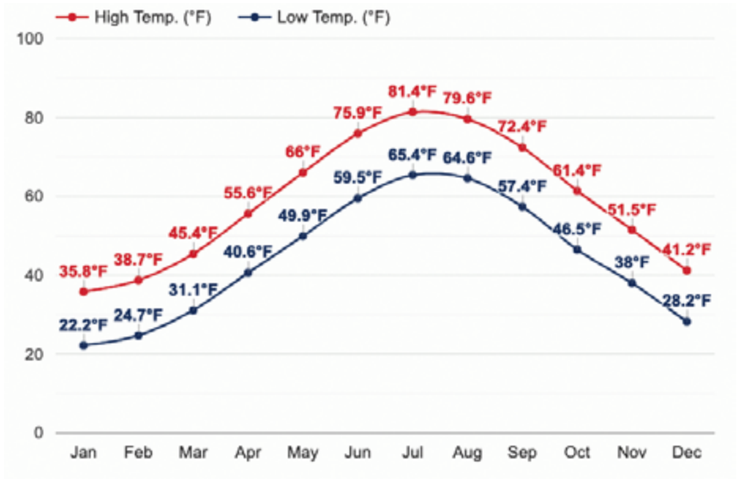
Figure 56

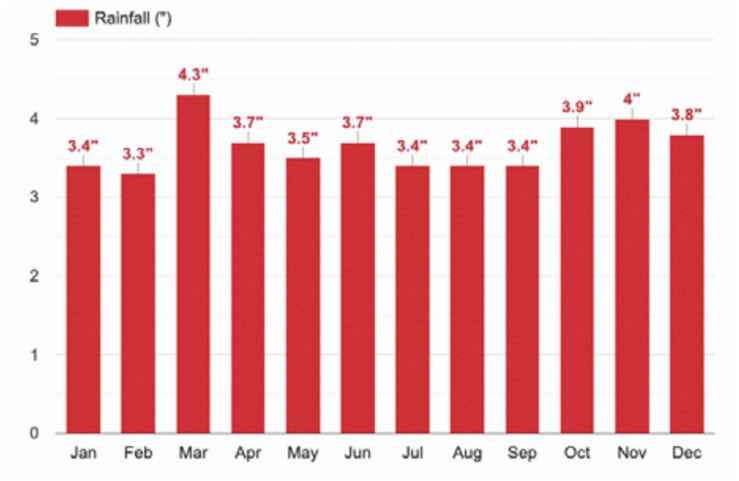
Proposed Site Conditions

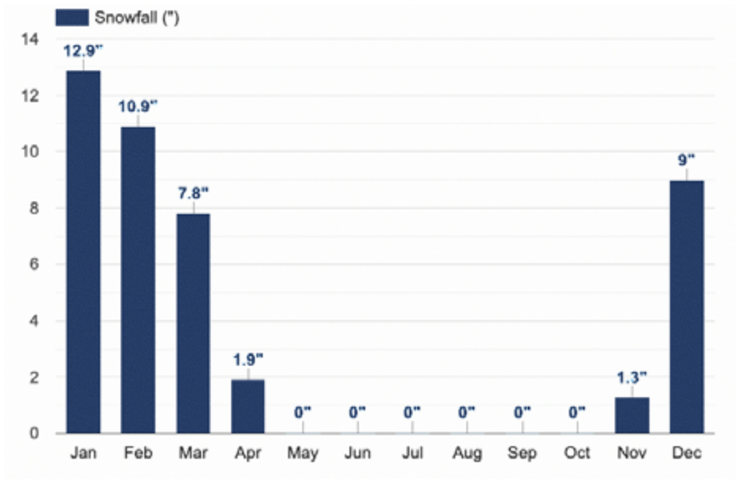
As mentioned on the last spread, the MBTA has no plans in the foreseeable future to move away from the Cabot Yards. However, the current location of the MBTA facilities within the railyards complex in a long term perspective create a lose-lose situation for both the MBTA and future developers of the area. Knowing that a large amount of the surrounding area will be developed in the near future, the MBTA will be permanently boxed in to their existing footprint and will find it difficult to expand or rebuild portions of their facilities. Along with this, the ability to add any additional tracks for trains will be very slim.

Pictured in the figure to the left are three different zones that make up the current site area. the bright white area on the left of the site is currently owned by the City of Boston and is the location of their Tow Lot. As of 2021, the Tow Lot site is up for sale with the intention of being purchased for future development. The faded white zone, shown in the middle of the site, is the location of both the Widett Circle lot and the MBTA/Amtrak tracks that run through the city. There is no intention of ever relocating the path that the trains run through the site, however the idea of building the tracks underground has been discussed in the hopes of future proofing it from any rising sea levels in the city. The last zone, the bright white area on the right end of the site, is the home to the MBTA Cabot Yards maintenance facility and storage. While there has been discussion of relocating the facility to a different area of town, there have been no formal movements to move the building.

When considering the long term planning and future of this area in Boston, the city would be better served having this area service their community as opposed to it serving their public transportation maintenance facilities. If this area were to be re-purposed to properly serve the fast growing south end of Boston, it would call for the removal of the Boston City Tow Lot and the MBTA Cabot Yards complex. With those two components removed, decking would need to be built over the rail tracks to maximize its buildable area. Looking at figure again, the bold white areas are able to be developed on the ground level while the faded white area would be developed by using the previously mentioned decking. In the case of the bold white zone on the left, that could be developed using decking as well to maximize the site's circulation.





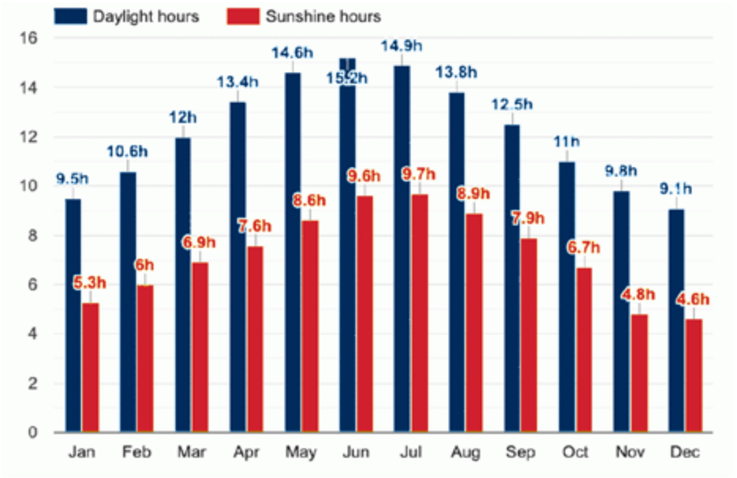


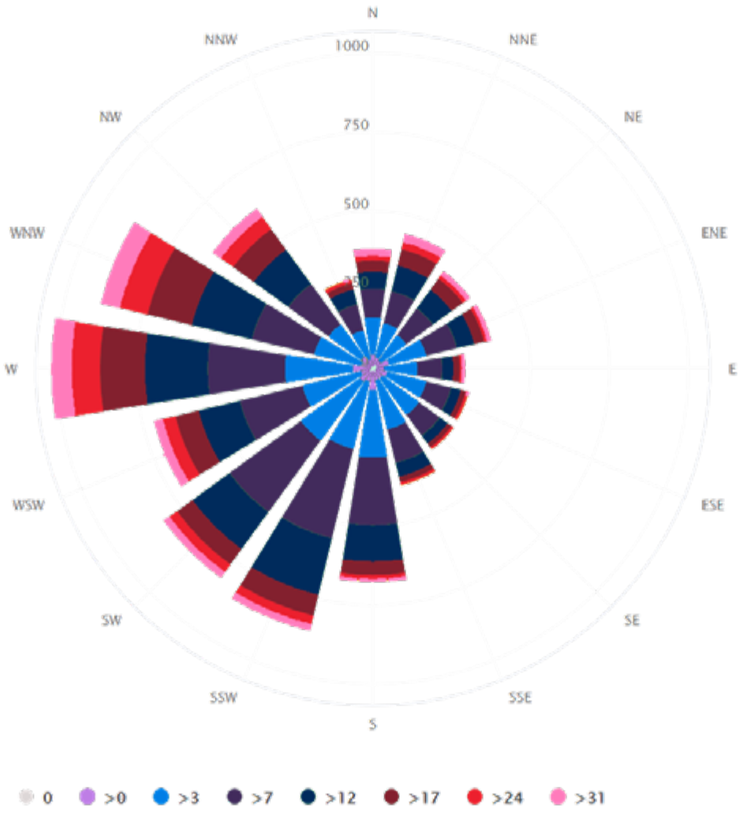
Figures 57-59

Temperature

The top left chart shows the average peak daily temperature per each month as well as the average minimum daily temperature in each month. In Boston the spring and fall months are quite comfortable for an average person to be outside for long periods of time. The winter months see the city taking on long periods of time where the temperature would be below freezing. In the summer months the temperature appears to be warm, but is not at a level of heat that would leave many people feeling uncomfortable. Despite the temperatures, the other elements like wind and snow could create more frequent uncomfortable conditions. To best account for any potential uncomfortable conditions for humans, spaces that are able to be indoor spaces should be climate controlled. Depending on the frequency of use and typology of the space, rolling doors that allow a space to be opened to the outdoors could be beneficial.

The northeast, particularly where Boston is located, is susceptible to large amounts of snowfall during the peak winter months that range from December-March. Considering that the city is one that is densely designed and populated, snowfall management will be an important consideration on the site, particularly a site that is a large scale. The same considerations can be made for an area that is built within a mile of the Atlantic Ocean. Knowing where the majority of rainwater flows to in Boston will help minimize the amount of water that ends up staying on the site. When it comes to the exact site, its natural hydrology should work to be maintained if possible to assist existing rainwater management as a system that can be reused.





Figures 60-61

Sun and Wind

The top left figure pictured shows both the average number of daily daylight hours per month and the average daily sunshine hours per month. In the peak months of summer, Boston can see up to 2/3 of the day having some level of daylighting. Inversely, during the winter months, the city might see as little at 5 hours a day with direct sunlight and only half of the day with any level of daylighting. Noting the lack of daylighting during the winter months can be important knowledge to know as designing a building to be passively heated through daylight during winter months might not achieve the most ideal results.

Looking at the wind rose that shows the overall wind patterns throughout the year, Boston gets a considerable amount of wind throughout the year. The wind that enters the city mostly comes in from the west, southwest, and south directions. Many of the winds that sweep through will tend to bring either similar temperature winds or slightly warmer wind with them. In the summer time, these breezes will prove to be beneficial in maintaining comfort and preventing humidity from completely taking over the climate. In the winter, however, the breezes will only increase the level of discomfort, leaving residents wanting to minimize the amount of time spent in the outdoors.

As far as the stadium development would be concerned, the wind analysis can help benefit the creation of the form before it starts. Knowing that a majority of the wind blows in from the west to south range can prevent any level of openings being formed in the facade from those directions that could negatively impact the interior open-air space. In previous stadia, we have seen wind tunnels formed due to design revisions that negatively impact the visitors experience as well as impact the ways that players may be able to perform.

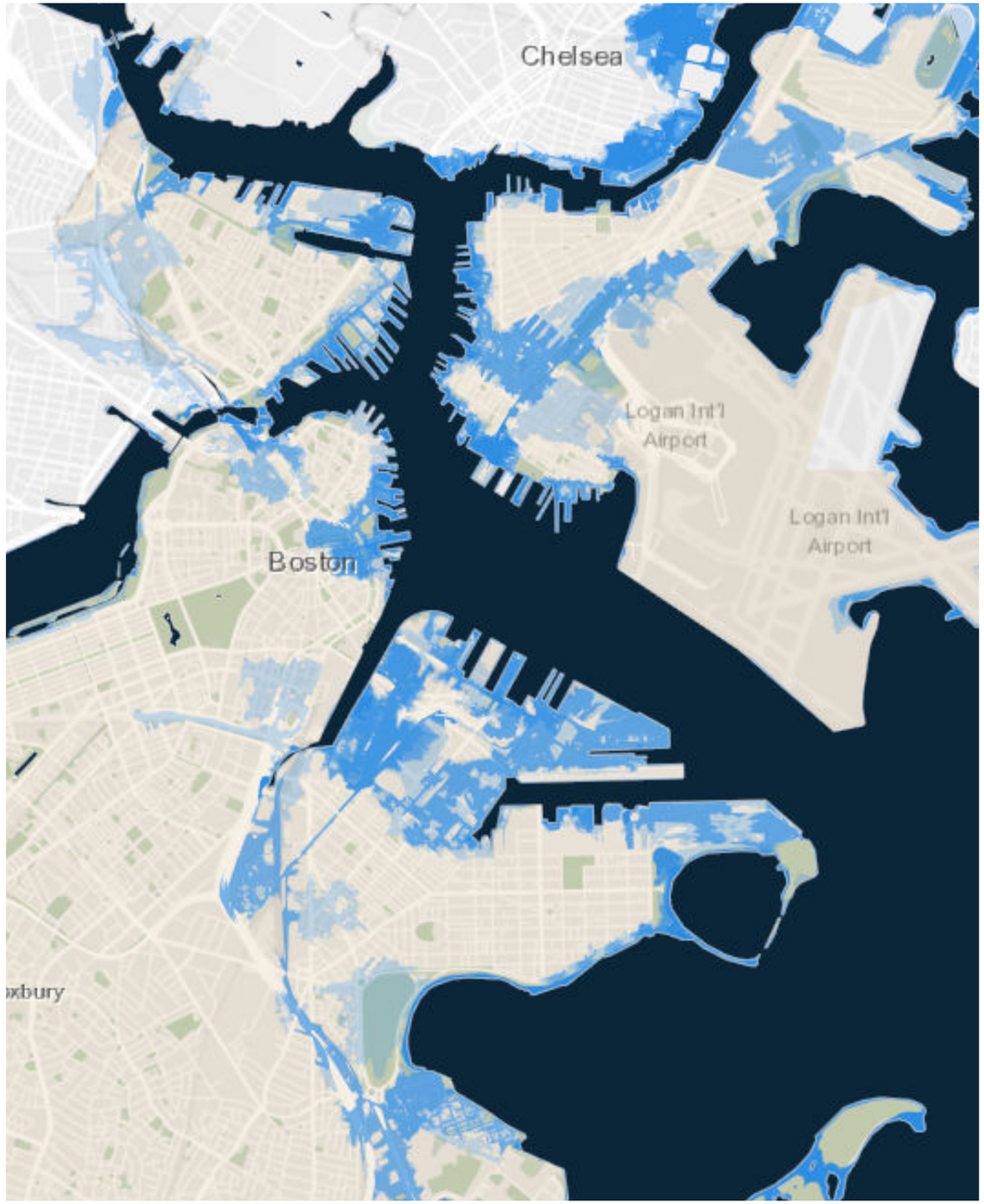


Figure 62

Flooding Potential

The figure on the left shows potential flood risks within the city of Boston up until the year 2050. As shown in the dark blue, Boston is surrounded by and built around water. As the city was built over time, more of the Massachusetts Bay was infilled for the city to expand and was typically built close to sea level. This infill land as well as the existing land is shown in the light grey with the Boston city limits shown in a cream color. The medium blue coloring shown on the diagram represents the 1% annual flood risk in the year 2030. Positioned alongside it in the light blue coloring is the representation of the 1% annual flood risk in the year 2050. Both the year 2030 and 2050 are significant landmark years for cities and countries as far as representing progress or catastrophe regarding climate change and the corresponding rising sea levels.

Looking deeper at the map, the primary areas that look to be impacted within Boston are South Boston, Downtown Boston, East Boston, Charlestown, and Chelsea. The primary reason why these neighborhoods are more impacted than others is due to the fact that they exist along the Massachusetts Bay, a relatively standstill body of water. Along the western end of Boston is the Charles River which pushes the water away from the neighborhoods it runs through. While those areas will eventually be prone to flooding, they will have more time to prepare than other areas.

In South Boston, where the site is located, the districts most prone to flooding are the Seaport District and Columbus Park/ Andrew Square. The latter district is home to the potential railyard development and is directly connected to the bodies of water through a small river that runs alongside Interstate 93. Since this area has always been a railyard, there have been little changes made to the site that would have raised it above the sea level to prevent long-term flooding. Knowing this, the city has investigated rebuilding some of the rail tracks underground to combat the issue long-term and enclose the railways. If any development were to go on top of the railyard, it would be important to know where the rainwater would flow and ensure that it does not pose any potential threat to the existing infrastructure underneath.

Figure 63

Performance Criteria

1. Space Allocation

In order to best allocate the spaces of the project, research will be done using buildings of similar typologies, mostly stadiums, that will be primarily used for soccer. While research has been unable to produce a detailed floor plan for a soccer-specific stadium, a football-specific stadium is capable of being used with the conversion of team spaces. As a case study, the Dome at America's Center Renovation will be used to show a spatial breakdown of how much square footage each floor is made of, what spaces make up those floor areas by percentage, and what spaces fall into these general groups. Once this information has been discovered, it can be analyzed what spaces can be used in a soccer stadium, which ones can't be used, and which ones are optional.

2. Environmental Performance

As seen from previously completed stadiums over the course of the last five years, environmental performance is an important process that all stadiums should be designing for and taking seriously. When looking at the Mercedes-Benz Stadium in Atlanta, Georgia, we are now able to see the methods in which a stadium can be highly sustainable instead of an energy absorber. As a stadium that achieved LEED Platinum Certification, we have seen the positive impacts it had on the city such as rainwater storage, renewable energy, and air quality improvements. Currently, it is expected that stadiums should be able to achieve a minimum of LEED Silver, but as more projects emphasize sustainability we continue to see methods in which we can have LEED Gold or Platinum being the baseline expectation.

3. Financial Performance

As previously stated, the project currently has available funds of up to $400 Million to spend on a soccer-specific stadium in the heart of Boston. However, a private-public partnership is still feasible based on the concept that the public would fund the portions of the project that are available for year-round use. To split the cost, it is crucial to create a division of spaces that are team-exclusive and spaces that are public. Once these spaces are divided, they can all be given construction costs or at least rough estimates. These estimates will serve as the totals that show how much is paid for by the public. It will be seen as successful financially if the finances are able to successfully divide the project's cost into a cost for the public and cost for the team.

4. Behavioral Performance

One of the major things to consider when looking at the behavioral performance is the usage pattern of the space. In the case of a complex with multiple functions, there will be multiple clients and time frames to consider. The project can be considered successful if a time frame is able to be determined that creates an opening time and a closing time for the complex.

5. Psychological Performance
When considering psychological performance, things that can be considered are the aesthetics of the design as well as a refinement on the thought of what this typology is. When we think of what a mixed-use stadium is, many think of a stadium that can rent out the field and has a beer hall convertible to a restaurant. However, this project being done successfully could see the mixed-use stadium being thought as something new.

6. Environmental Impact
This performance criteria will work directly with the environmental performance. And similar to the environmental performance, using as little energy to construct and maintain operations of the building will be critical. Along with energy, utilizing as little water as possible while collecting potential rainwaters will also benefit the building long-term. The best way at this point in time to ensure that the environmental impact is considered is to implement applicable green technologies during design.

7. Energy Consumption
One of the more challenging aspects for the performance of a building's impact on the environment is the amount of energy it uses. Using applicable building and energy codes and standards will help create a project that is successful in using the baseline level of energy. Through passive strategies like daylighting and implementing solar panels, the building will use methods in an attempt to give back energy to the surrounding environment as well as minimize any energy needs.

8. Building Codes
Similar to any building typology or any building that has to be constructed, they have to be both designed and constructed to the International Building Code, ADA Standards, and local code standards. The best way to ensure that this is done is to use their local code books during the design process to ensure that these considerations are being met and do not have to be redesigned at a later time.

Executive Summary

To ensure that the performance criteria are truly considered during the architecture thesis, the best practice would be to observe, research, and implement the criteria during all phases of the project. Even before the design begins, looking at best practices or case studies that utilize these methods will be greatly beneficial to see how it is done and how much space it would take to achieve. For example, one criteria is seeking to implement solar panels to minimize the amount of electricity taken from the grid and if done correctly could be self-sufficient electricity. However, proper site analysis and building orientation will greatly impact the ability to make that happen. Along with this, cost must be a factor to ensure that the budget does not get inflated. While solar panels are known to have a high initial cost, that initial cost can be reduced by temporarily leasing them before fully purchasing them.

Another criteria, the building codes, are not an optional criteria. Any building that will be constructed in Boston has to follow any applicable building code in the City of Boston. This is where research will also be beneficial, as Boston may have its own level of unique building codes due to it being a city that is prone to flooding and is vulnerable to future sea levels rising. Knowing this information before the design process starts will lead to a lack of redesigning for these codes and help the process continue on a consistent schedule.

Even some of the more optional building criteria, like Environmental Performance as determined by standards like LEED, may not always be optional. For example, any government building in some states may be subject to hitting a baseline level of LEED certification, whether that be LEED Certified, Silver, or Gold. Before continuing with the project, research must be done to verify if the building is subject to meeting any baseline certification. From there, the design can continue using applicable green standards and practices.

Space Allocation Case Studies

The Dome at America's Center, St. Louis

Movie Theater Prototype

The Revolution Hotel, Boston

Figure 64

Dome at America's Center Renovation

St. Louis, Missouri
Populous, HKS Inc (2012 Renovation Proposal)

Description

Located in the heart of Downtown St. Louis, the Dome at America's Center was designed with football in mind as the primary tenant. Before the departure of the St. Louis Rams, the Dome had a proposed renovation intended to modernize the facility and bring it up to the NFL's top tier standards. To make this design happen, the proposal looked to demolish the eastern half of the dome and rebuild it with a larger footprint after rerouting Broadway St.

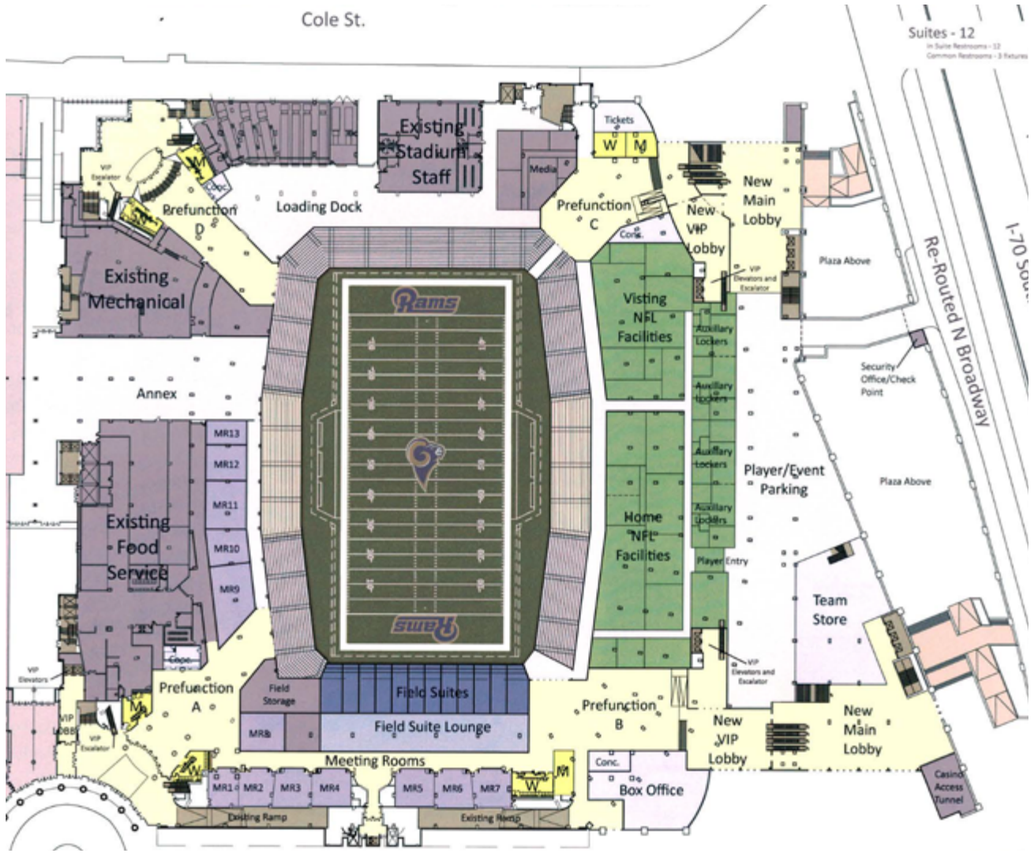
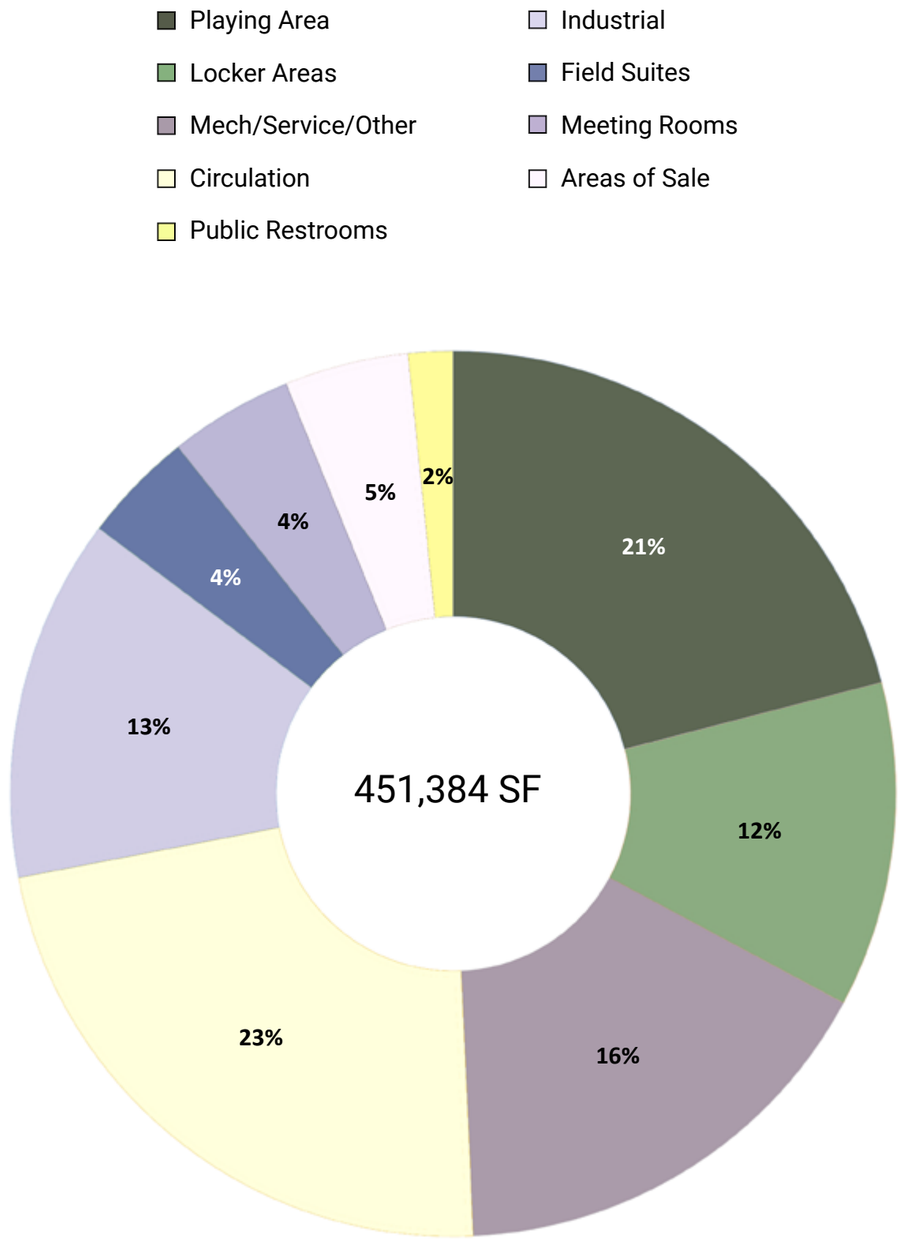


Figure 65

Spatial Breakdown



Event Level (Level 1)

Located on the ground level of the Dome at America's Center, the self-titled Event Level is the floor that contains the majority of spaces that are required to make an event happen. Along with this, the level also contains the primary stadium entrances where fans may enter, go through security, and take escalators and elevators up to the concourses.

Required spaces in a Soccer-specific Stadium

- Playing Area
- Circulation
- Locker Area
- Industrial
- Areas of Sale
- Mech/Service/Other

Optional spaces in a Soccer-specific Stadium

- Field Suites

Spaces not required in a Soccer-specific Stadium

- Meeting Rooms

Meeting Rooms (20,770 SF)	
Average Meeting Room	1,598 SF

Field Suites (18,710 SF)	
Field Suites	11,010 SF
Field Suite Lounge	7,700 SF

Public Restrooms (7,490 SF)	
Men's Restrooms	3,574 SF
Women's Restrooms	3,916 SF

Playing Area (96,110 SF)	
Field of Play	57,600 SF
Sideline Space	38,510 SF

Circulation (104,100 SF)

Locker Area (54,524 SF)	
Home Locker Room Spaces	18,045 SF
Visiting Locker Room Spaces	14,260 SF
Auxiliary Locker Room	10,515 SF
Player Spaces	5,920 SF
Media	5,782 SF

Mech/Service/Other (75,500 SF)	
Food Service	40,808 SF
Mechanical Space	18,446 SF
Stadium Staff	3,342 SF
Field Storage	4,504 SF
Elevators	8,400 SF

Industrial (60,900 SF)	
Loading Dock	27,650 SF
Player/Event Parking	33,250 SF

Areas of Sale (20,770 SF)	
Team Store	11,260 SF
Box Office	7,873 SF
Tickets	1,637 SF

Main Concourse Level (Level 2)

Located on the second level of the Dome at America's Center, the Main Concourse Level is the floor where the majority of ticketed fans will walk to get to either their seat in the lower bowl or continue to the upper levels. In some stadiums, like this proposal has, we begin to see the trend where club spaces and suites are more intertwined with the seating bowl. Despite consuming a considerable amount of space on the east and west sides, fans are still able to circulate around them to access their seats.

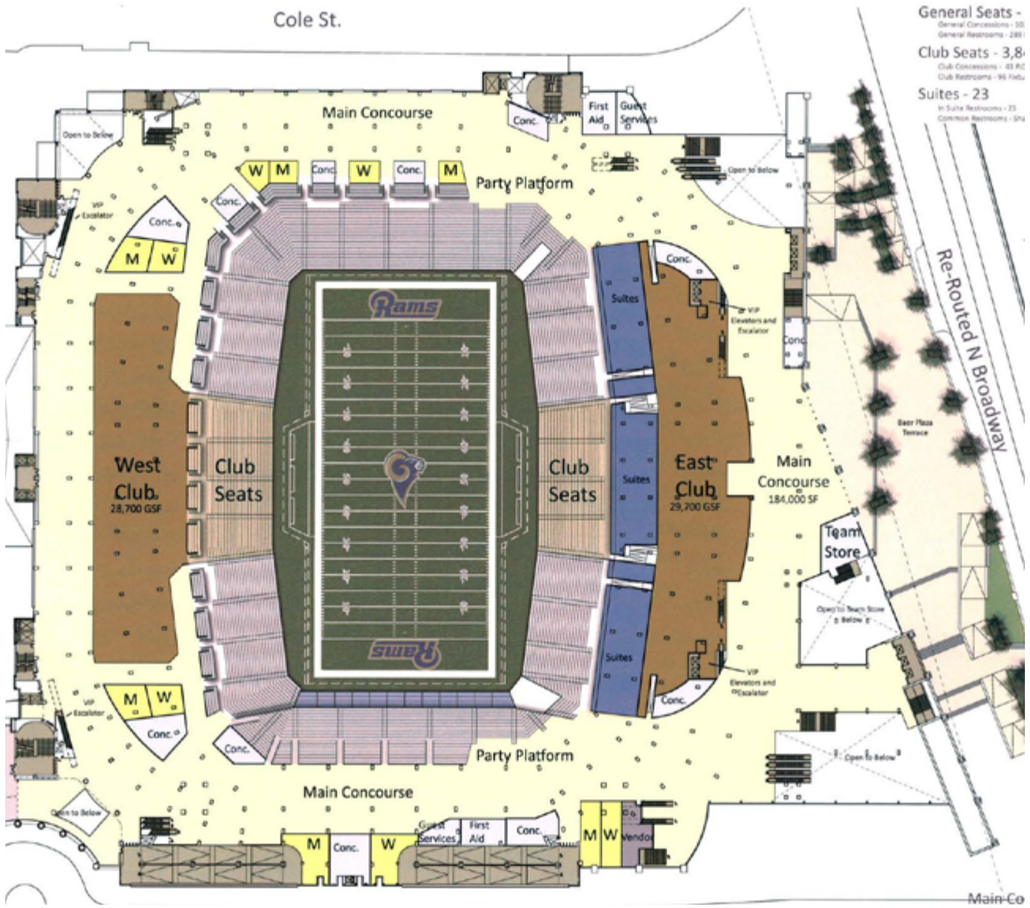
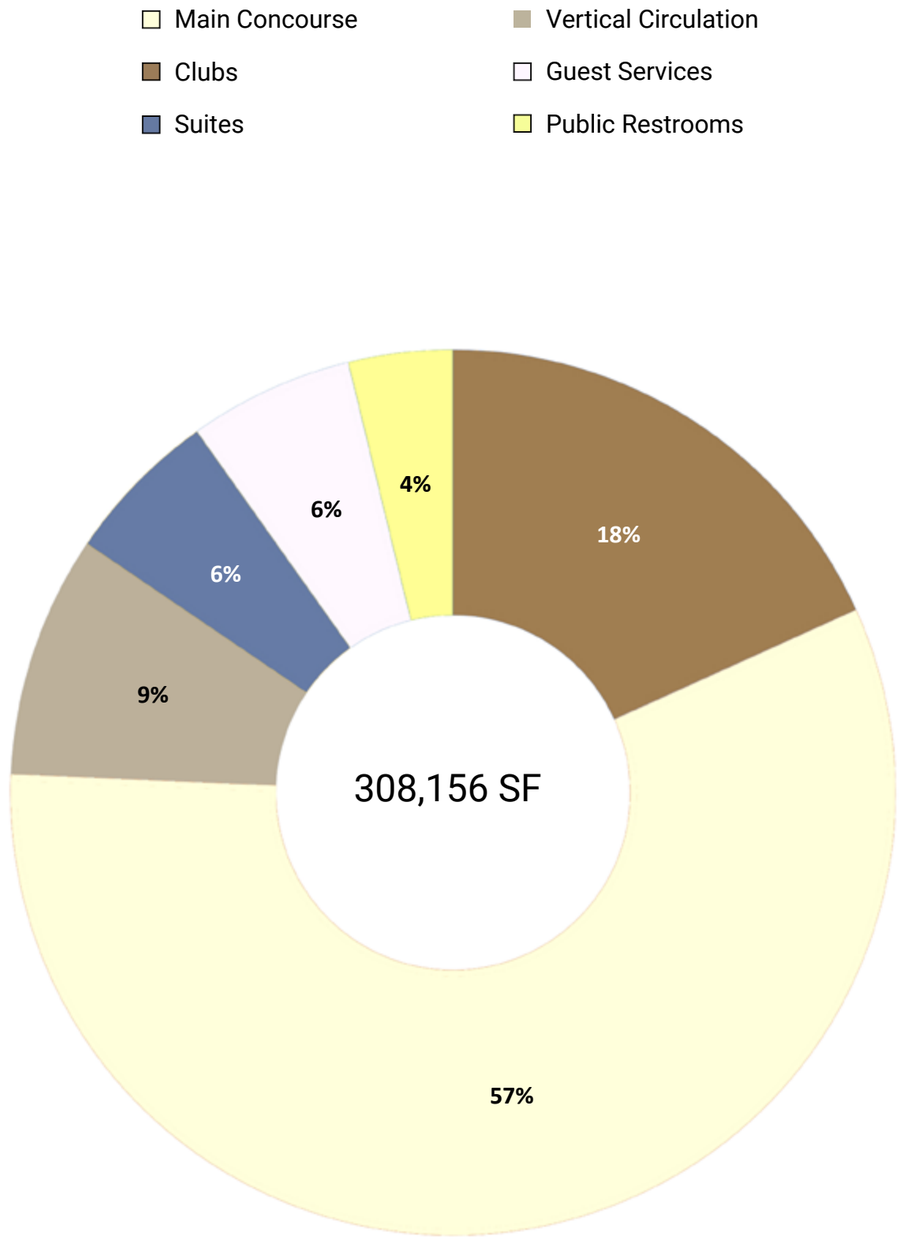


Figure 66

Spatial Breakdown



Main Concourse Level (Level 2)

Required spaces in a Soccer-specific Stadium

- Main Concourse
- Public Restrooms
- First Aid
- Vertical Circulation
- Concessions
- Guest Services

Optional spaces in a Soccer-specific Stadium

- Clubs
- Suites
- Team Store

Spatial Analysis

- With the exception of the club and suite spaces, the main concourse level has the spatial attributes of a typical stadium concourse level.

- The main concourse encircles the playing field and seating bowl to promote walkability in the stadium and create easy access to entries and exits.

- Surrounding the main concourses, as is typically done, are the restrooms and concessions. The amount of concession space is equal to the amount of restroom space.

- In a more recent trend, the proposal looks to add premium seating such as clubs and suites onto every level and disperse it evenly instead of compiling all of it on one or two levels.

- The typical circulation spaces within a stadium's main concourse will take up to half of the respective floor's floor space.

Main Concourse (184,000 SF)	

Clubs (58,400 SF)	
East Club	29,700 SF
West Club	28,700 SF

Vertical Circulation (28,270 SF)	
Stairs	11,590 SF
Elevators	3,740 SF
Ramps	12,940 SF

Guest Services (19,282 SF)	
Concessions	13,200 SF
Team Store	1,800 SF
Guest Services	1,832 SF
First Aid	2,450 SF

Suites (18,204 SF)	
Average Suite Size (3)	6,068 SF

Public Restrooms (12,184 SF)	
Men's Restrooms	6,147 SF
Women's Restrooms	6,037 SF

Lower Suite Level (Level 3)

Located on the third level of the Dome at America's Center, the Lower Suite Level is only built on the western half of the stadium with the eastern half being open to the Main Concourse Level directly below. Sandwiched between the two levels of concourses, the level builds off of the existing vertical circulation to provide extra amenities, socialization space, and premium seating spaces to a dome that may otherwise be lacking with it.

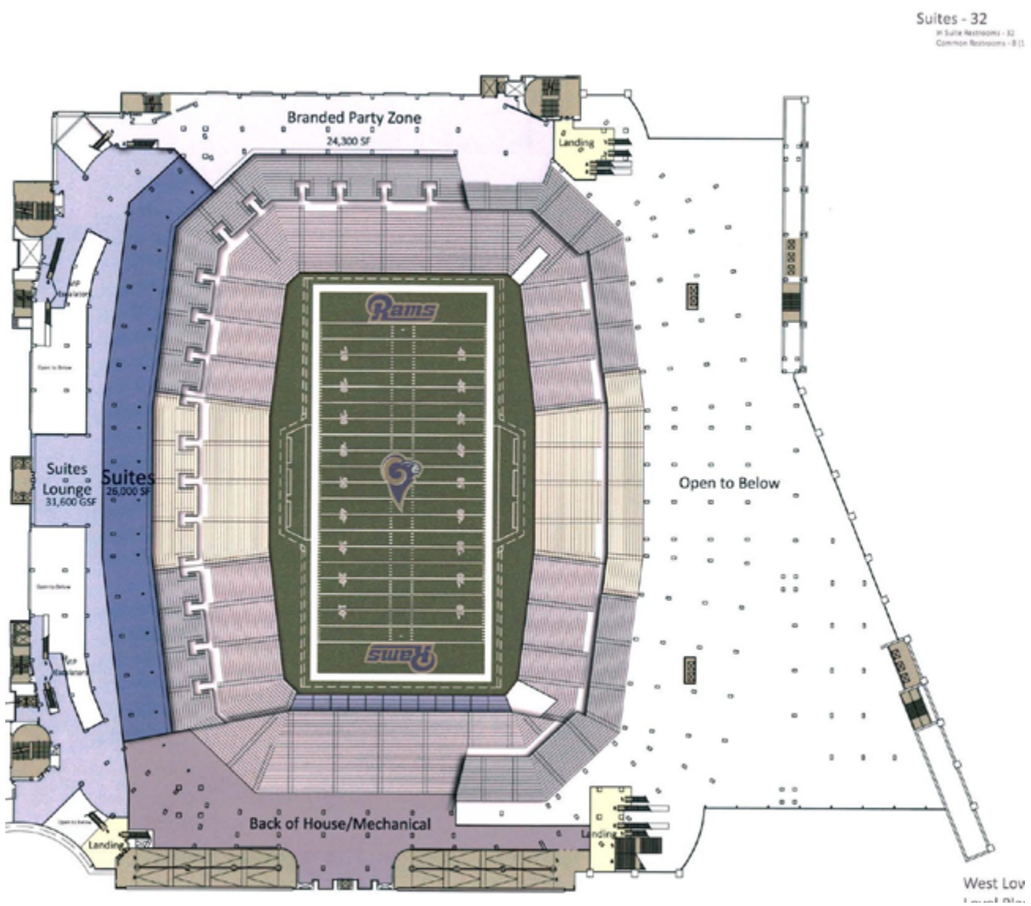
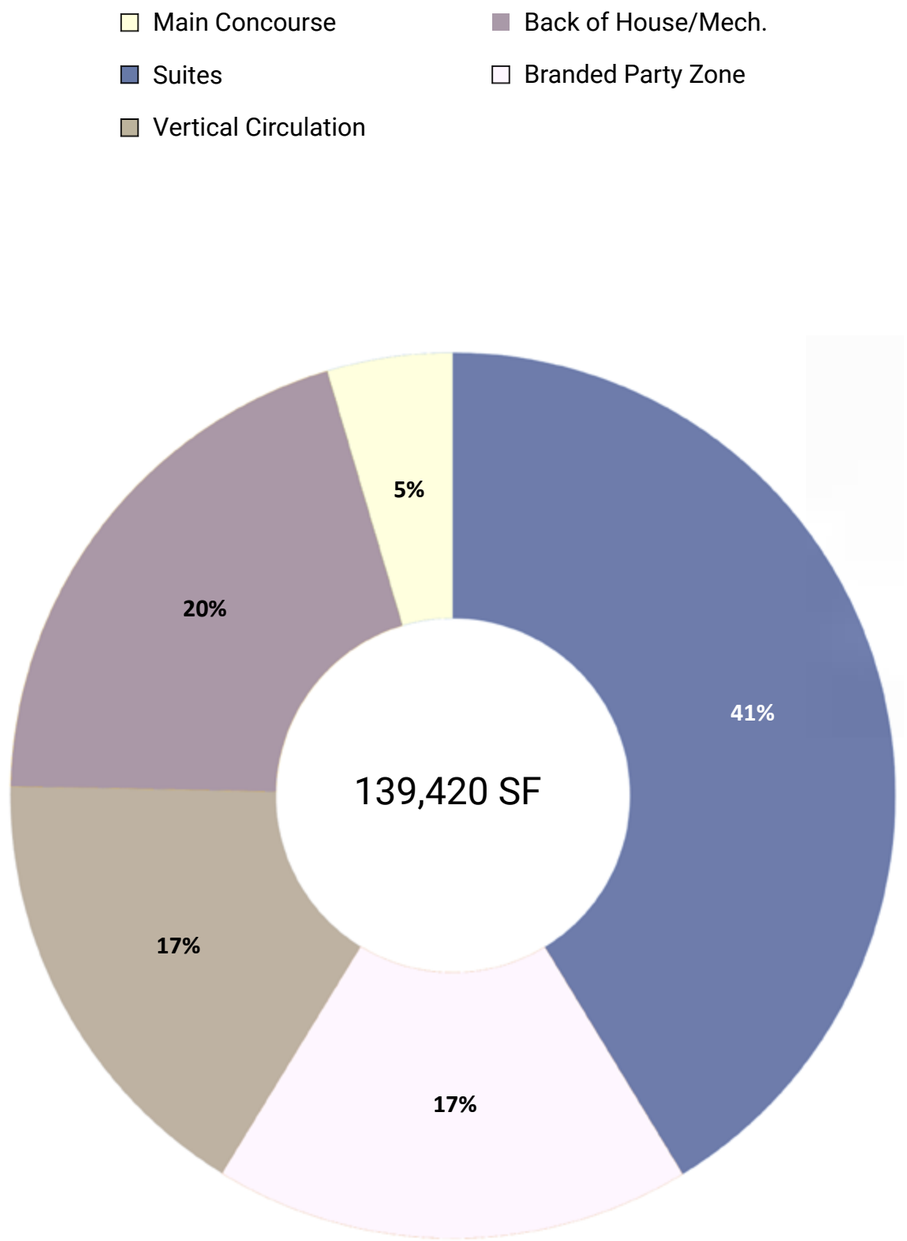


Figure 67

Spatial Breakdown



Lower Suite Level (Level 3)

Required spaces in a Soccer-specific Stadium

- Main Concourse
- Vertical Circulation
- Back of House/Mech.

Optional spaces in a Soccer-specific Stadium

- Suites
- Branded Party Zone

Spatial Analysis

- Standard to any stadium suite level, a majority of the space is composed of either suites, lounges, or other forms of premium seating

- The back of house space on the Suite Level primarily functions as a kitchen space to serve the premium seating spaces.

- The branded party zone, many of which have been seen sponsored by Bud Light, provide fans with an extra area to socialize and grab food and beverages.

- If a suite level were to be designed for a soccer-specific stadium, this would be a starting point to design a level of premium seating

Main Concourse (6,400 SF)

Suites (57,600 SF)	
Suites	26,000 SF
Suites Lounge	31,600 SF

Vertical Circulation (23,120 SF)	
Stairs	7,830 SF
Elevators	2,046 SF
Ramps	13,244 SF

Back of House/Mech. (28,000 SF)

Branded Party Zone (24,300 SF)

Bud Light Zone, Scottrade Center. St. Louis, Missouri

Figure 68

Club Level (Level 4)

Located on the fourth level of the Dome at America's Center, this floor is built half for general seating and half built for club seats and suites. Looking at the spatial breakdown, the floor area of the premium seating is roughly equal to the floor area of the concourse on the level. Like other clubs previously shown, there is a back of house space connected to the club to provide the area with a kitchen space and storage.

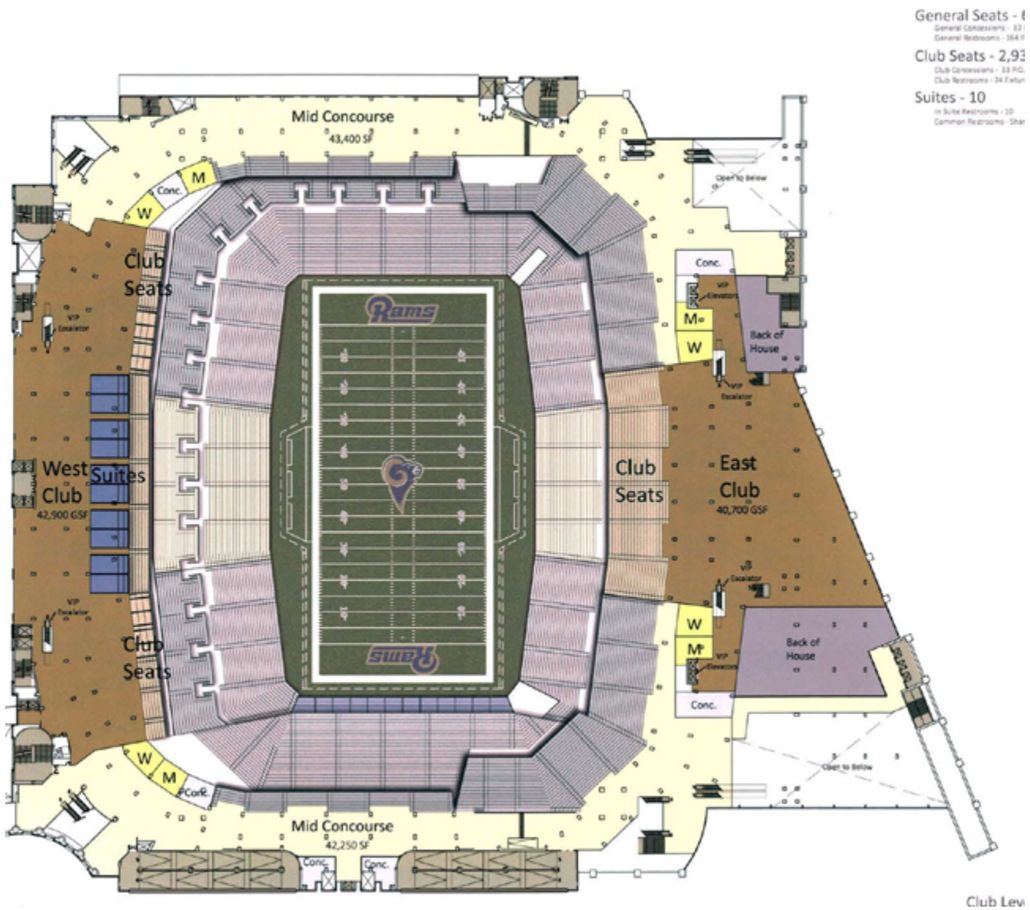
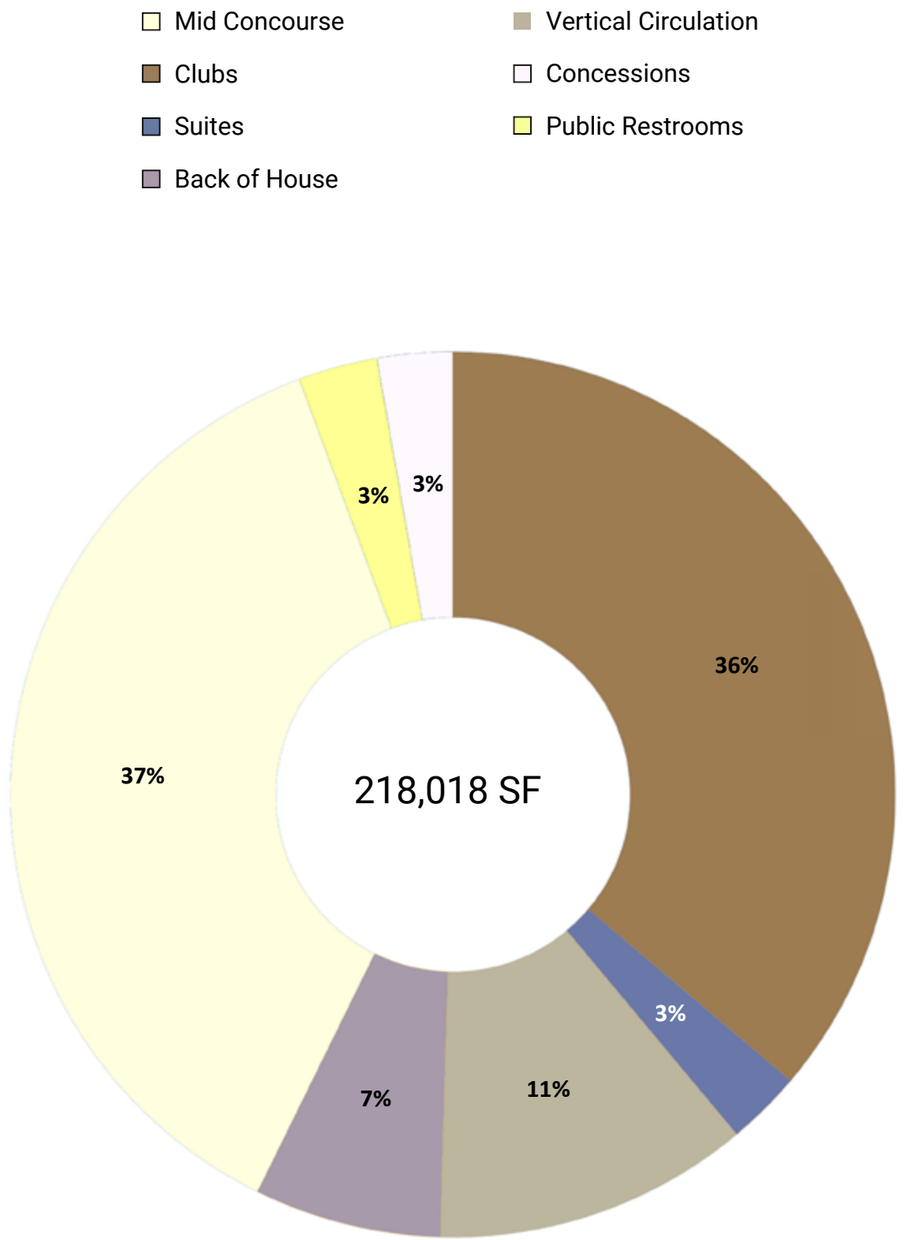


Figure 69

Spatial Breakdown



Club Level (Level 4)

Required spaces in a Soccer-specific Stadium

- Mid Concourse
- Vertical Circulation
- Concessions
- Public Restrooms
- Back of House

Optional spaces in a Soccer-specific Stadium

- Clubs
- Suites

Spatial Analysis

- The amount of space that concessions and public restrooms take up is roughly equal.

- More often than not, the concession stands and the public restrooms are grouped together along the perimeter of the concourse.

- The amount of vertical circulation on each level is not always consistent due to the stairs, elevators, and escalators not going consistently to every floor.

Mid Concourse (85,650 SF)	
North Concourse	43,400 SF
South Concourse	42,250 SF

Clubs (83,600 SF)	
East Club	40,700 Sf
West Club	42,900 SF

Vertical Circulation (26,658 SF)	
Stairs	9,828 SF
Elevators	3,890 SF
Ramps	12,940 SF

Concessions (6,362 SF)

Suites (6,330 SF)	
Average Suite Size (10)	633 SF

Public Restrooms (6,674 SF)	
Men's Restrooms	3,088 SF
Women's Restrooms	3,586 SF

Back of House (15,780 SF)

Movie Theater

Prototype

Description

Designed in 2004 by an unknown architects, the Cinemark Prototype of a Movie Theater accurately represents what a typical movie theatre looks like in the 21st century. Standard to how theaters have been laid out, upon entry into the main lobby a spectator will be asked to present a pre-purchased ticket or purchase a ticket at the booth. From there, the patron can head to the nearby concessions stand for their food and beverages or continue toward the main hallway. The main hallway is typically designed with theaters on either side of the corridor and ends with an emergency exit. The theaters themselves, as they have been designed for many years, feature sloped seating with either one or two exits that are located on the ends.

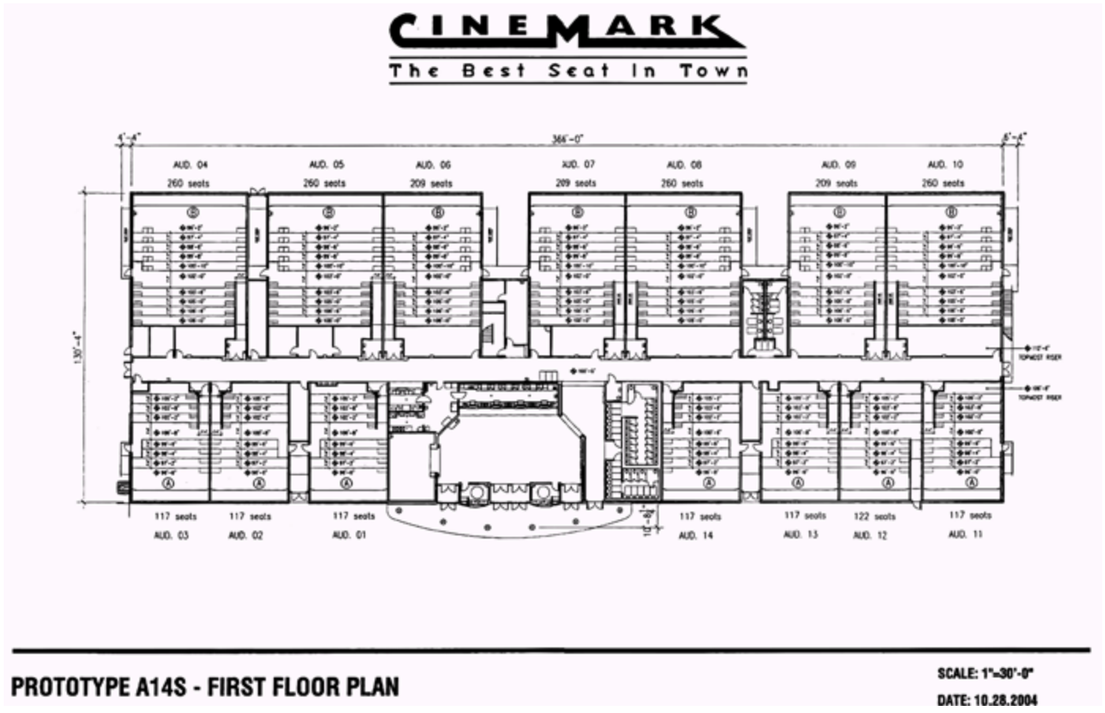
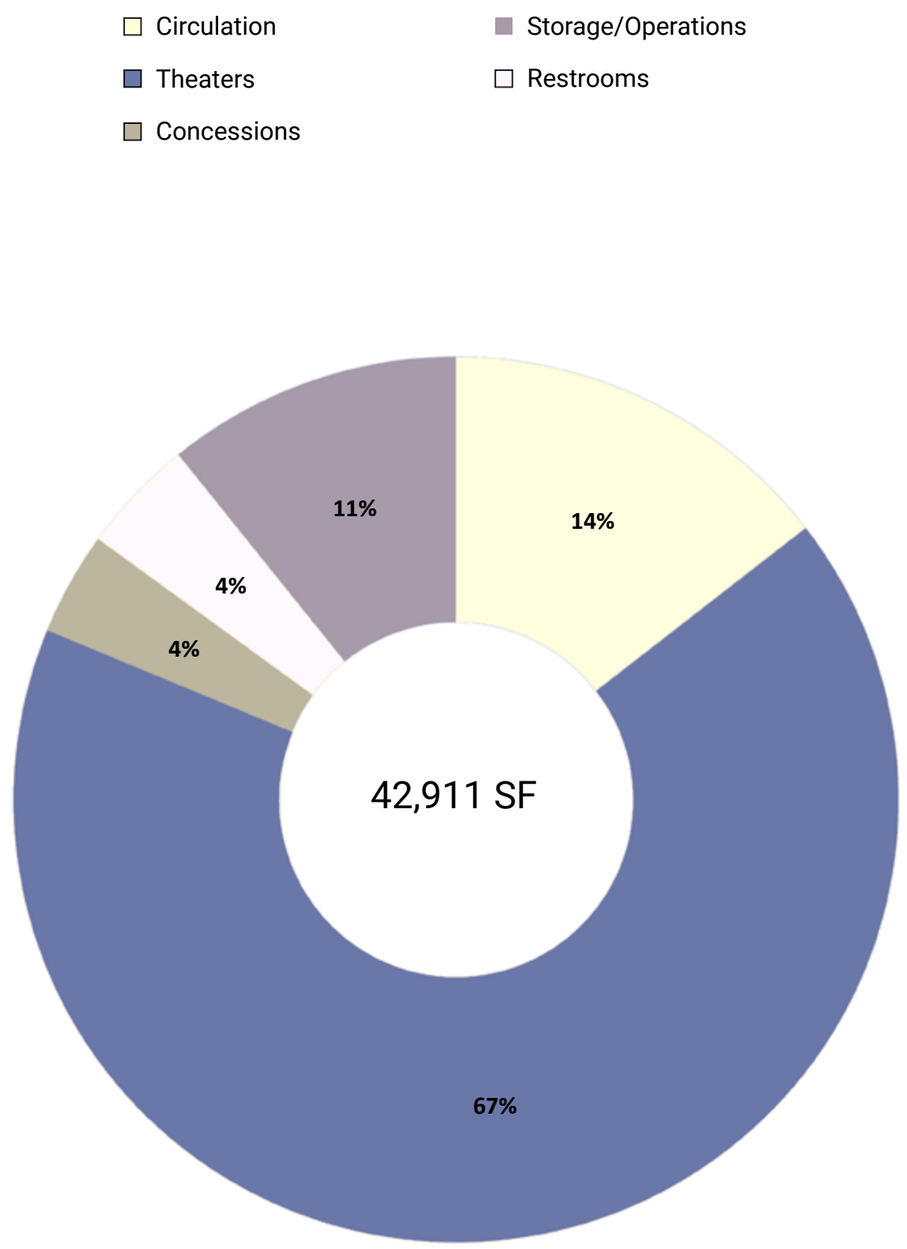


Figure 70

Spatial Breakdown



Spatial Analysis

• The theaters that have roughly the same seating capacity tend to have very similar, if not equal square footages.

• The slopes of a theater are already built and part of the structure. Considering that, the theater is capable of holding different types of seating. As shown below, these seats could be wider and more oversized seats to cater more toward luxury rather than maximizing the number of seats.

• In some movie theaters, there will be secondary concession stands located at either end of the main hallway. They are made primarily to serve customers for refills or food and beverage during the film to shorten their walk time back to the primary concession stand.

Analysis as a Stadium Suite Level

• The stadium's suites will be able to utilize the existing concessions to serve the culinary needs of a suite. **To best maximize the dining needs, a larger kitchen space will be needed.**

• The lobby should function the same for both programs due to their need for ticketed access.

• In a stadium suite, it is standard that there is a kitchenette and counter space for the food and beverage. This can be accomplished by installing casework along the walls of the theaters.

Figure 24

Circulation (6,223 SF)	
Main Hallway	4,105 SF
Lobby	2,118 SF

Theaters (28,642 SF)	
Theater 1	2,678 SF
Theater 2	2,644 SF
Theater 3	2,276 SF
Theater 4	2,200 SF
Theater 5	2,702 SF
Theater 6	2,230 SF
Theater 7	2,702 SF
Theater 8	1,550 SF
Theater 9	1,588 SF
Theater 10	1,616 SF
Theater 11	1,592 SF
Theater 12	1,564 SF
Theater 13	1,680 SF
Theater 14	1,620 SF

Concessions (1,610 SF)	
Concession Stand	538 SF
Kitchen	566 SF
Storage	506 SF

Restrooms (1,808 SF)

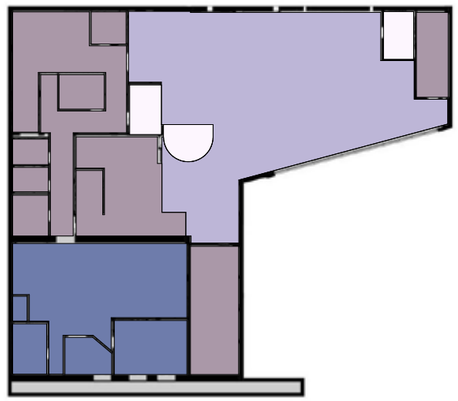
Storage/Operations (4,628 SF)

The Revolution Hotel

Boston, Massachusetts
Prellwitz Chilinski Associates, 2018

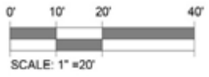
Description

Designed in 2018 by Preilwitz Chilinksi Associates, the Revolution Hotel in Boston is one example of what the modern hotel should be. Equipped with multiple lounges, a cafe, coworking space, and a large restaurant, the hotel provides more than just a place for visitors of the city to come and stay for the night. With modern, unique materials, a distinct layout, and a distinct set of furniture, the hotel aims to please the new wave of hotel guests. Even with competition, such as AirBnB, there is still a place in society for the hotel.



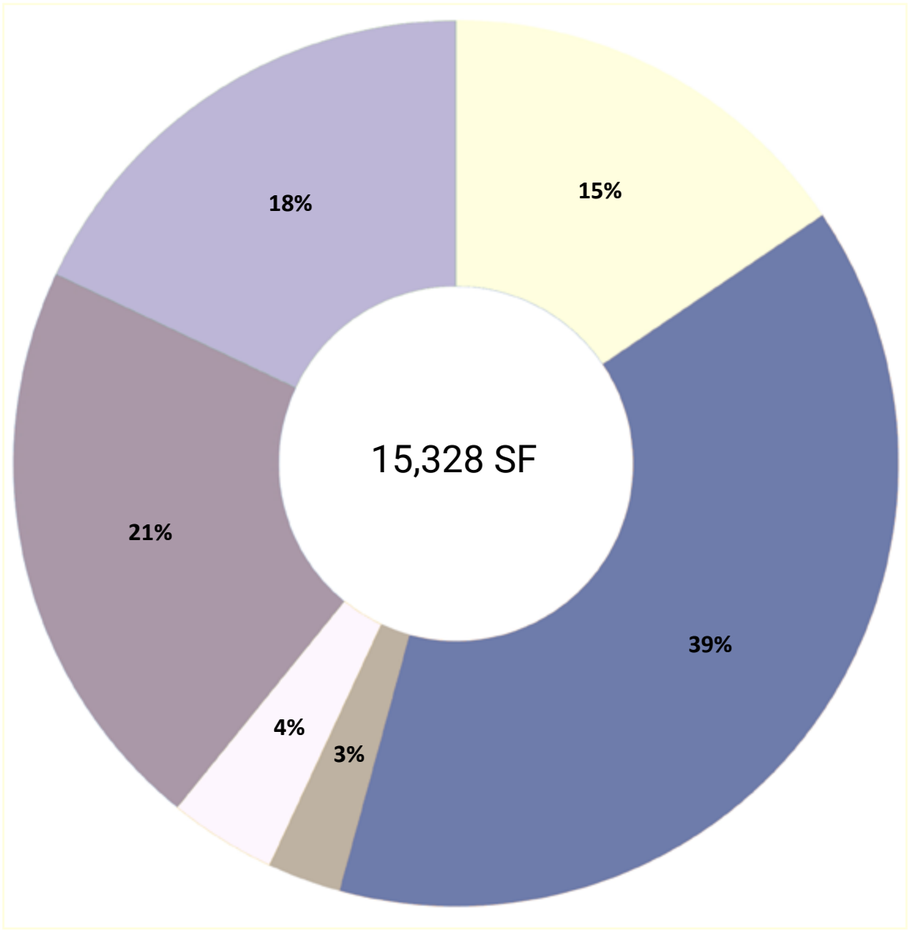
Revolution Hotel
Garden Level
1. "Conspire" Co-Working Space
2. Think Tank
3. Game Lounge
4. Bar
5. Fitness Studio
6. Vending Room
7. Self-Serve Beverage Station
8. TV Lounge
9. Restrooms
10. Back of House

Revolution Hotel
Floor 1
1. Mezzanine Lounge
2. Reception
3. Cafe
4. Cafe Lounge
5. Library Lounge
6. Restaurant
7. Courtyard (Restaurant)
8. Women's Room
9. Men's Room
10. Telephone Lounge
11. Back of House



Figures 71-72

Spatial Breakdown



Spatial Analysis

• The main lobby space is primarily composed of walkway spaces and flanked by other programs like reception, lounges, and restrooms.

• The restaurant's seating area is primarily on the first level with the kitchen and back of house being located upstairs.

• The hotel's first level is primarily public spaces, but there are security measures to ensure that not anyone can access elevators to get to the rooms.

• The second level of the hotel in this instance is primarily either a coworking space or back of house spaces to service the coworking area and the first floor.

• In the coworking space, the square footage of the working space is roughly equal to the square footage of the support spaces.

Main Lobby (2,902 SF)	
Main Lobby	1,395 SF
Reception	550 SF
Library Lounge	296 SF
Telephone Lounge	181 SF
Men's Restroom	218 SF
Women's Restroom	262 SF

Restaurant (7,234 SF)	
Restaurant Entry	990 SF
Restaurant	1,838 SF
Courtyard	2,273 SF
Kitchen Area	2,133 SF
Café (500 SF)	
Café	180 SF
Café Lounge	320 SF

Coworking Space (3,357 SF)	
Working Space	1,454 SF
Lounges	709 SF
Bar	350 SF
Fitness Center	494 SF
Restrooms	350 SF

Vertical Circulation (734 SF)	
Elevators	252 SF
Stairs	482 SF

Back of House (3,958 SF)

Conclusion

• As expected, the stadium portion of the complex takes up a considerable total of the overall square footage.

• The size of a one-story movie theatre and a seven story hotel were relatively similar.

• In the case of all three programs that are shown, a large percentage of their spaces are consumed by circulation paths and walkways

• All three programs have a certain level of social components that would be beneficial to intertwine in applicable areas

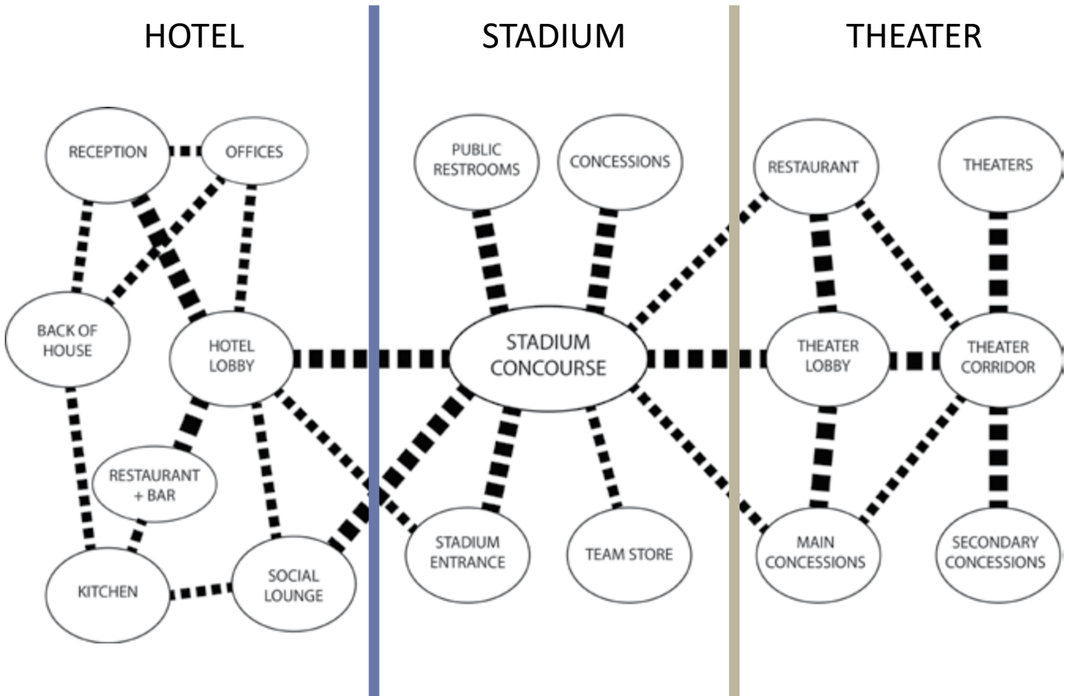
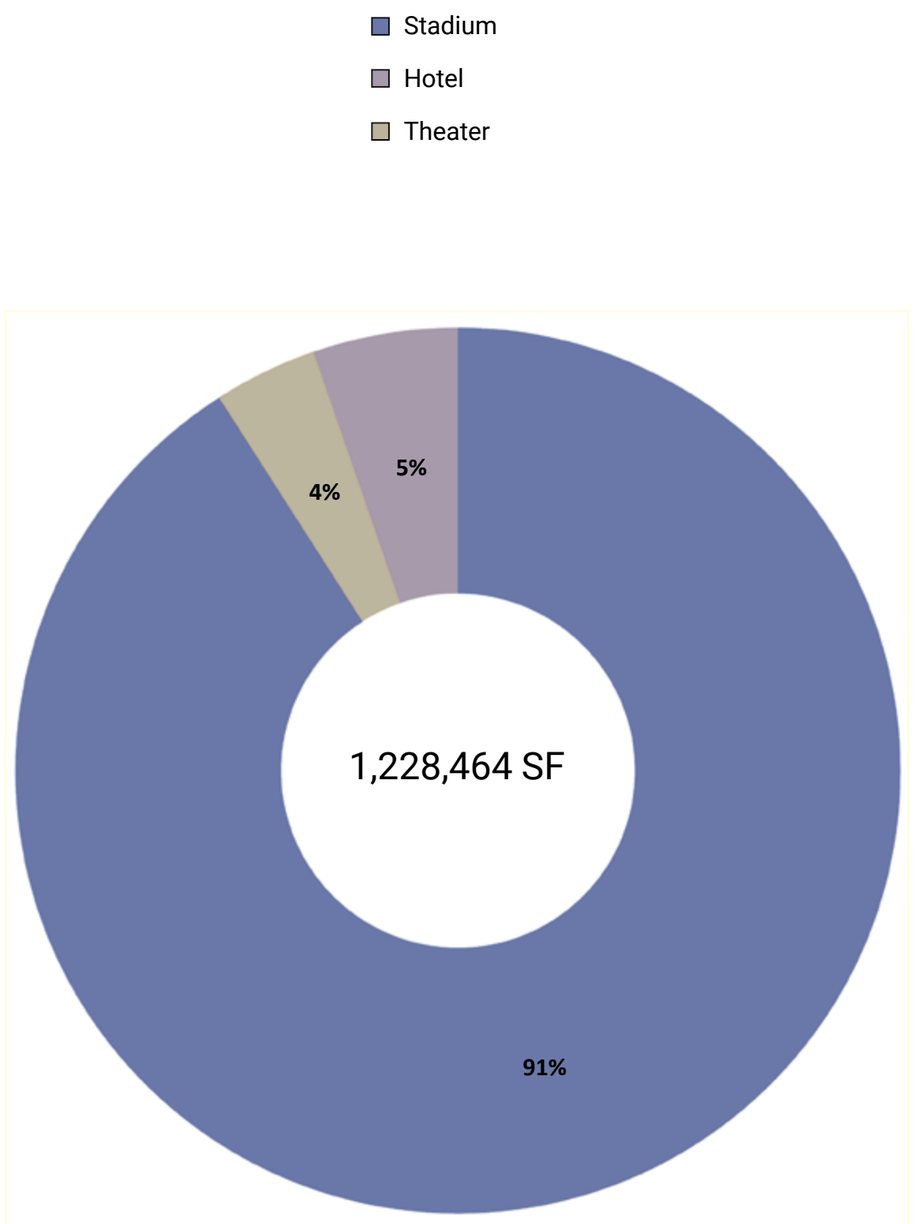


Figure 73

Spatial Breakdown



Thesis Design

Figure 74

Site Design

South End Stadium and Development

Description

As previously mentioned, one of the site's major hurdles is the development's ground level being split into two different heights. Dividing the east and west ends of the site is the railyard decking, causing the design to have two ground levels that are roughly 21 feet apart.

The second diagram highlights some of the existing proposed developments in the South End of Boston. Along Dorchester Avenue it has been proposed to add in multiple residential buildings, office buildings, and mixed use buildings. Along with all of this potential development, the currently MBTA Red Line is still capable of handling future traffic and a larger capacity.

The third diagram examines the primary potential views that can be visible from the site. While South Boston will be developed to the south and the east, the west can not be developed further due to the interstate and the north is already built out, exposing Downtown and Back Bay.

1 - SOCCER STADIUM
2 - VISITORS CENTER
3 - MOVIE THEATER
4 - HOTEL
5 - PARKING GARAGE
6 - OFFICE BUILDINGS
7 - RESIDENTIAL
8 - GAMEDAY PLAZA

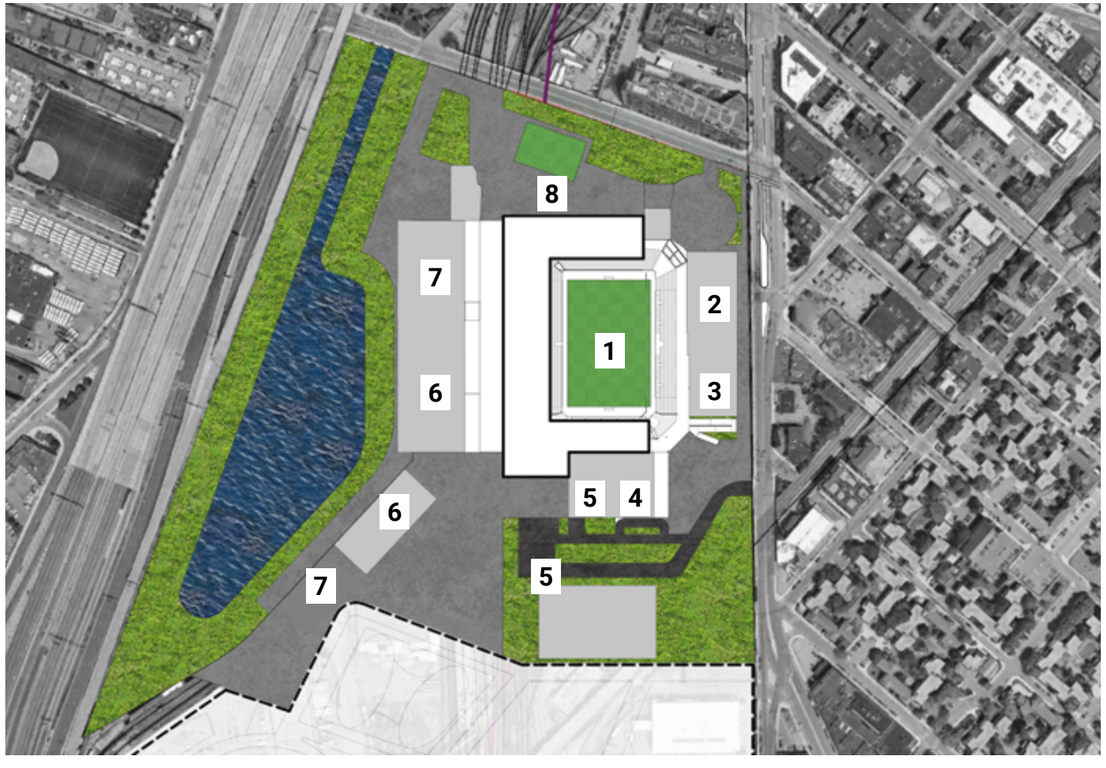


Figure 75

Diagram 1

Elevation Analysis

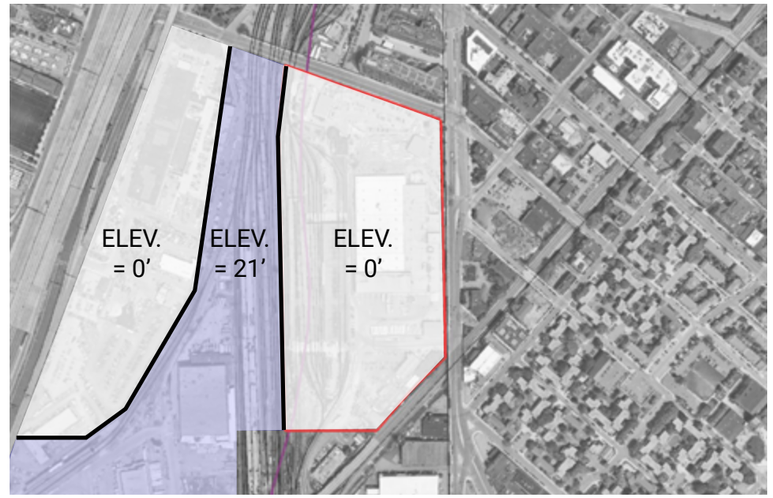
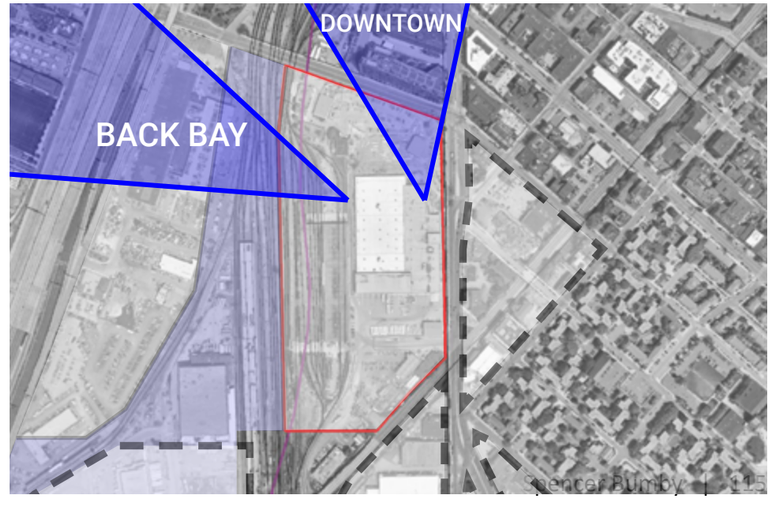


Diagram 2

Proposed Development

Diagram 3

Views from Site



Figures 76-78

Site Development

South End Stadium and Development

Description

After deciding on the initial location, the MBTA Cabot Yards area, initial site considerations had to be evaluated. While the maintenance facilities and other surrounding buildings are capable of being demolished and relocated to more suburban areas of Boston, it is almost impossible to have the rail lines relocated seamlessly without massively impacting the train operations in New England. Knowing this, the best way to initial approach developing this new Midtown Boston area would be to build along the site's perimeter in the first phase and then build into the center of the site more. While this would be happening, there would be structural decking built over the railyards that would make the area ready for development when the time comes.

The idea behind the massing shown to the right is that the mixed use components that benefit the community should be the first things built. From there, community entertainment spaces can be built as well as tourism programs like a hotel. Once all of this has been created in a clockwise pattern, the development is left with a large open green space in the middle. With a well-designed mixed-use stadium, this open green space would be filled with a 20,000+ seat stadium still capable of operating as a community green space for 300+ days during the year.

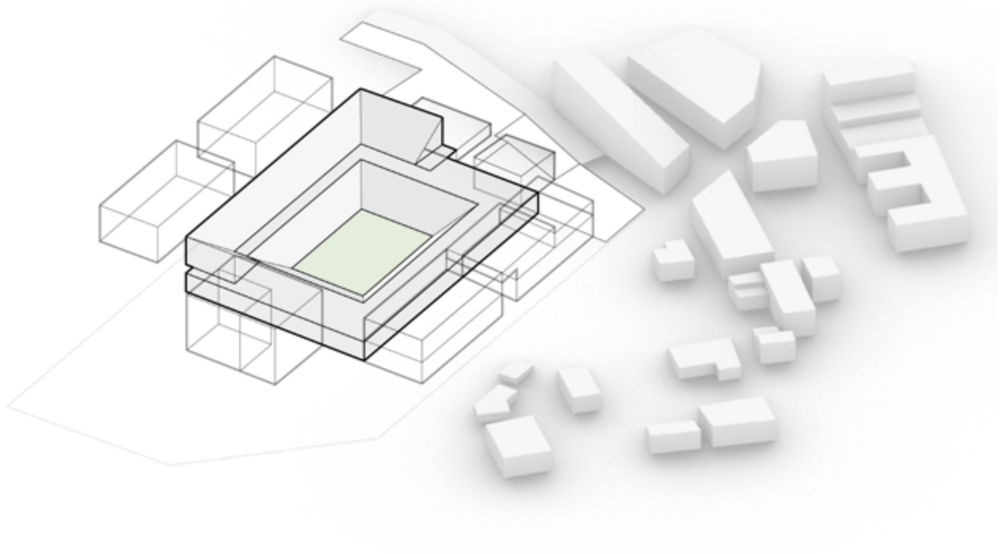
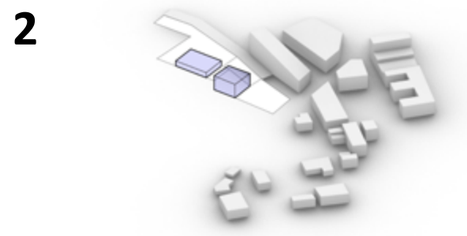
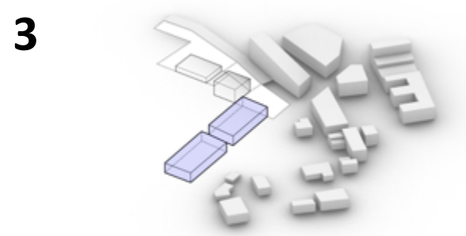
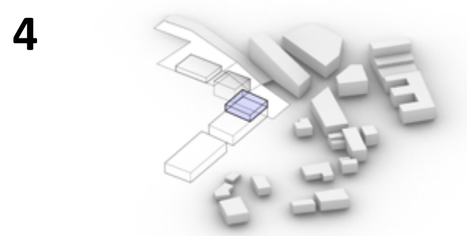
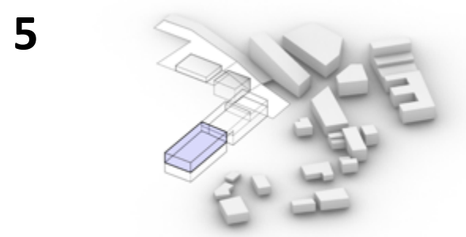


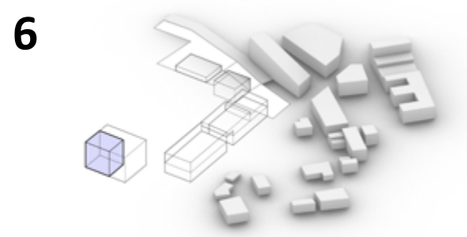
Figure 79

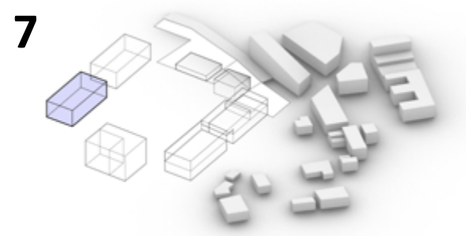












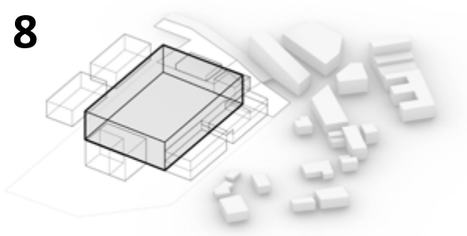


Figure 80

Structural Design

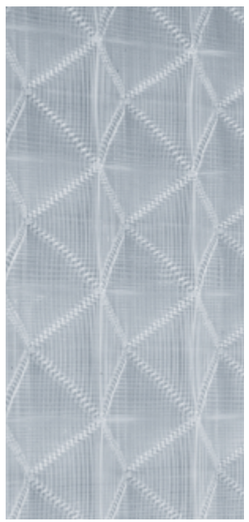
South End Stadium and Development

Description

The structure of the South End Stadium is primarily composed of concrete columns, with some level of metal structural support. Looking at the skin, specifically located on the building's northern facade, it is made up of ETFE Panels. This decision was made to create a lightweight facade that was highly flexible in its form and semi-transparent to allow for more freedom in design while being able to capture ample levels of daylight. Along with this, a lightweight material required less structure to hold it, allowing the structure system to stay more consistent along the upper and lower concourses. Designed with the ETFE system, each panel on the northern facade is line with LED lighting to create a dynamic lighting system and identity for the stadium. The seating bowl, like most stadiums that are now built, is built using precast concrete. By using concrete, the bowl can be specifically designed to meet what is needed to create successful views from each seat.

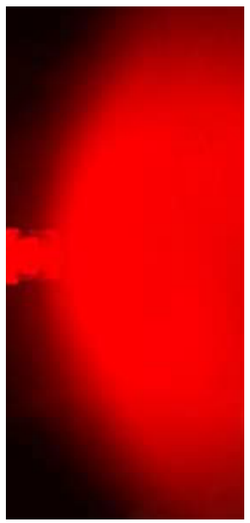
As a whole, each building in the South End complex was designed with their own respective structural systems instead of attempting to intertwine the development through structural elements. The decision to do so stems from a lack of a chronological order in which the buildings would theoretically be constructed. With any given intertwined structural system, certain elements would have to be placed before other elements to ensure that the building stays safe and supported. In some cases, like the proposed office building and residential building along the west side of the stadium, their programs could easily be changed as their design develops. With a potential design change, the buildings master planning needs to allow a level of structural flexibility to modify as necessary.

ETFE Panels

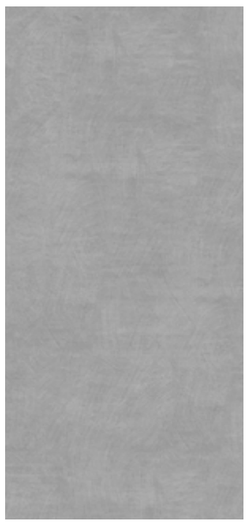


Brushed Metal

LED Lighting



Concrete



Figures 81-84

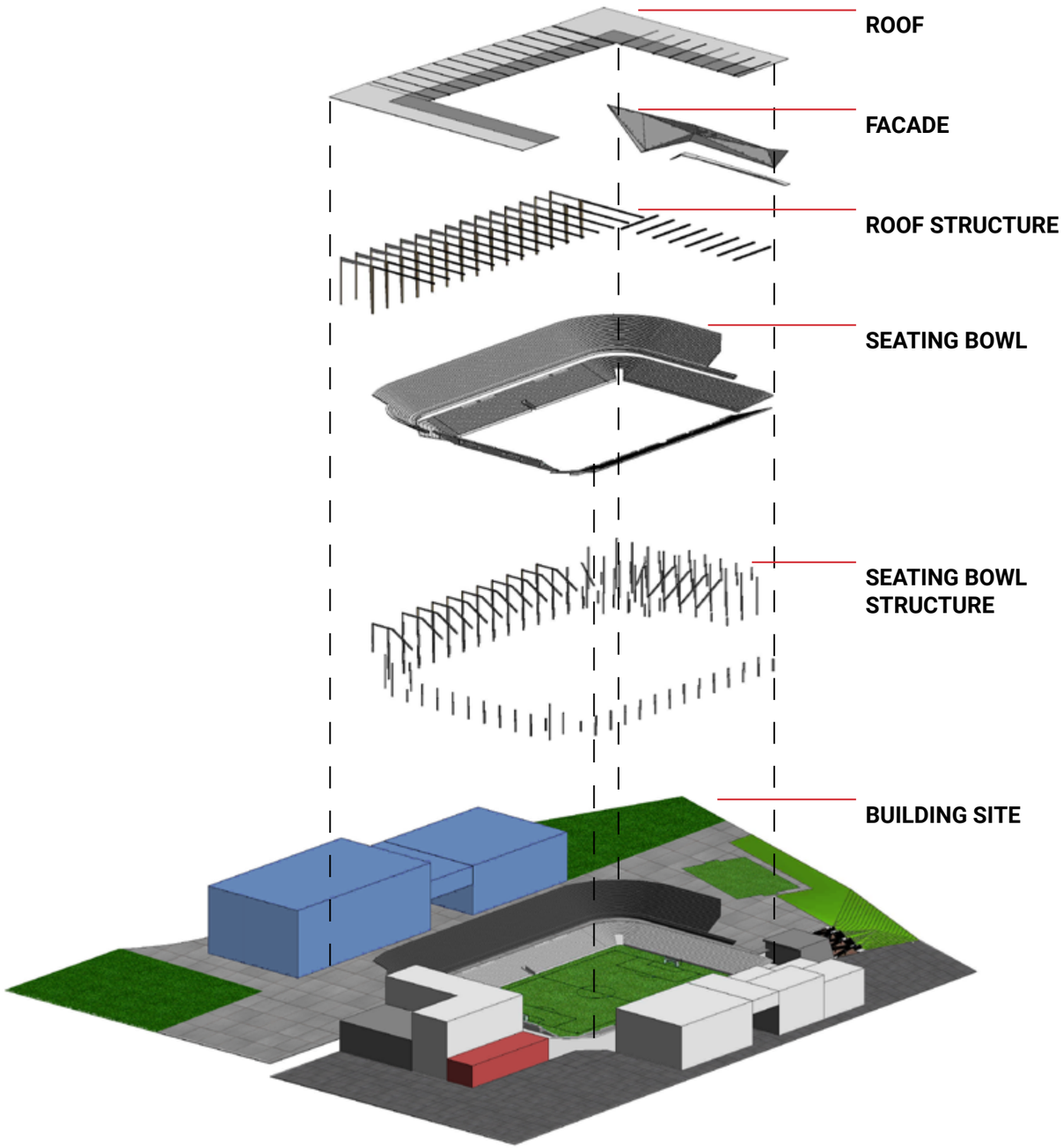


Figure 85

Event Level Floor Plan

South End Stadium and Development

Description

Programatically, the event level is split into thirds with the thirds being the stadium space, the turf space, and the public space. The stadium space, which wraps around the eastern and southern ends of the stadium, contains most of the team spaces, mechanical spaces, storage spaces, and circulation areas. The center of the event level holds the field of play area, where New England Revolution soccer team will play on their own premier turf. However, this turf will be retracted into a storage area when out of use to minimize the amount of wear and tear that could occur by public use of the area.

The east side of the stadium, which mostly hugs Dorchester Avenue, faces toward the South Boston residential area and will contain spaces that can serve them. Examples of these spaces would be a supermarket, restaurants, and entertainment areas. As an area that will see a substantial growth in the next decade, it is important to have areas for the community to be able to shop and to entertain.

From a circulation perspective, the north and east ends of the event level are primarily designed for pedestrian circulation. Considering that the MBTA Red Line drops off one block north of the site, it is expected that many Bostonians will visit the area using public transportation. For those who wish to visit the site using vehicles, the vehicular circulation and parking areas are located all along the southern end of the development.

- Retractable Turf
- Home Locker Rooms
- Visitor Locker Rooms
- Field Level Club
- Supermarket
- Restaurant + Bar
- Hotel Lobby + Parking

Figure 86

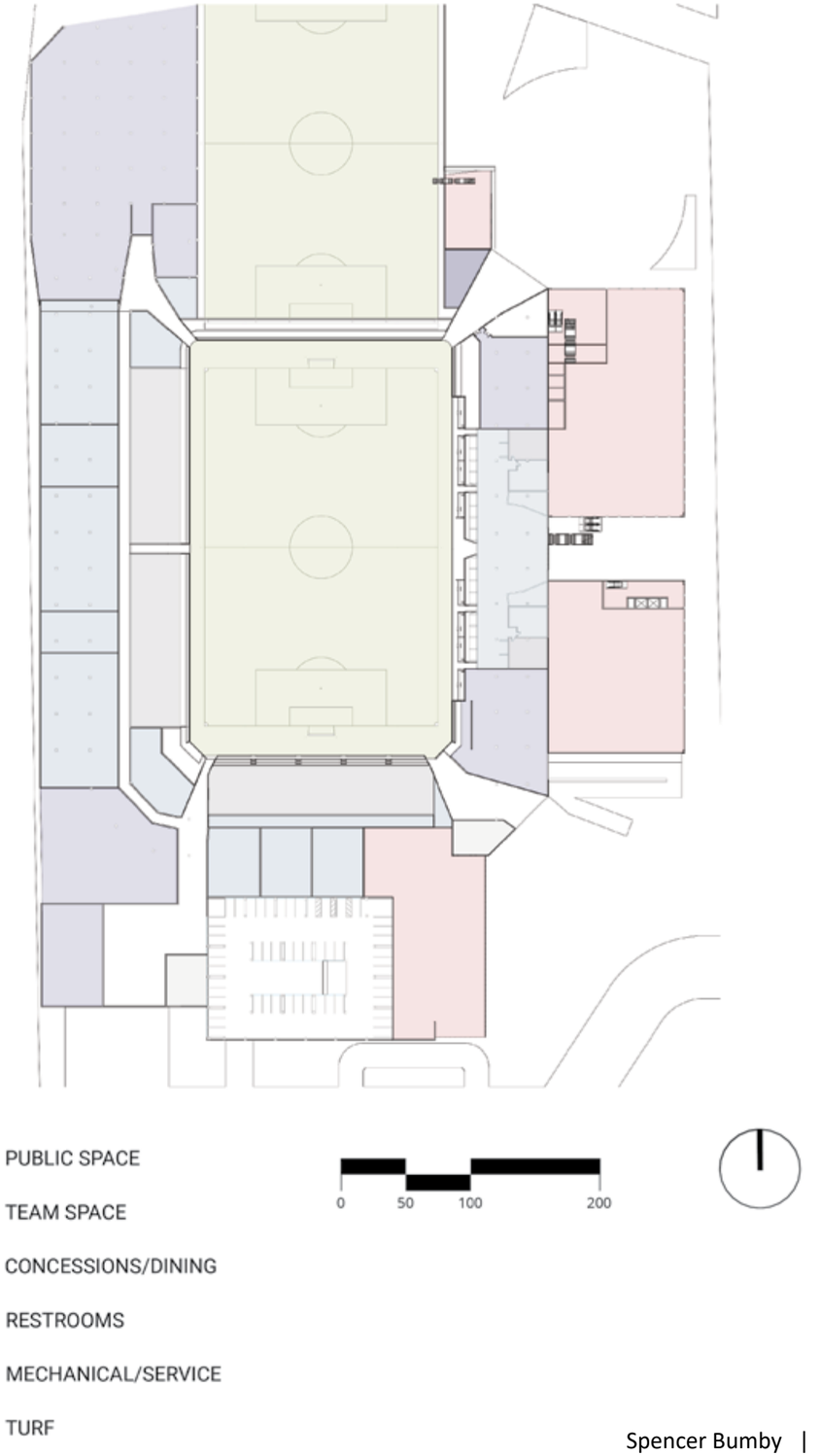


Figure 87

Main Concourse Level Floor Plan

South End Stadium and Development

Description

Similar to the event level, the main concourse level's east and south ends are dedicated to the public programs that are designed to serve the city of Boston and its surrounding neighborhoods. Compared to the event level, however, the main concourse level has the ability to expand toward the west due to it being built over the existing train tracks. With this expansion, future residential and office buildings will be constructed west of the stadium and will be connected to the complex through an enclosed grand hallway concept.

On the eastern (stadium) side of the grand hallway, the hall is lined with convertible restaurants. Compared to your typical restaurant, this dining space will have a larger restroom and kitchen shared with the concession stands of the stadium. While it is unlikely that the seating area and the concession stand will need to operate at the same time, the shared spaces were designed to withstand both.

As the topic of convertible spaces begins, the main concourse is a primary area that is designed to be used during public operations. As the primary circulation space, it connects the development to the community, which is also capable of connecting the development to specific areas within the complex. Most of the circulation will occur in the primary concourse with some additional areas of use being the seating bowls that will be retracted to make room for grass hills.

- Lower Bowl Seating
- Residential Building
- Office Building
- Concessions / Restaurants
- Hotel Lobby + Lounge
- Revolution Team Store
- Movie Theater
- Premium Seating Tower

Figure 88

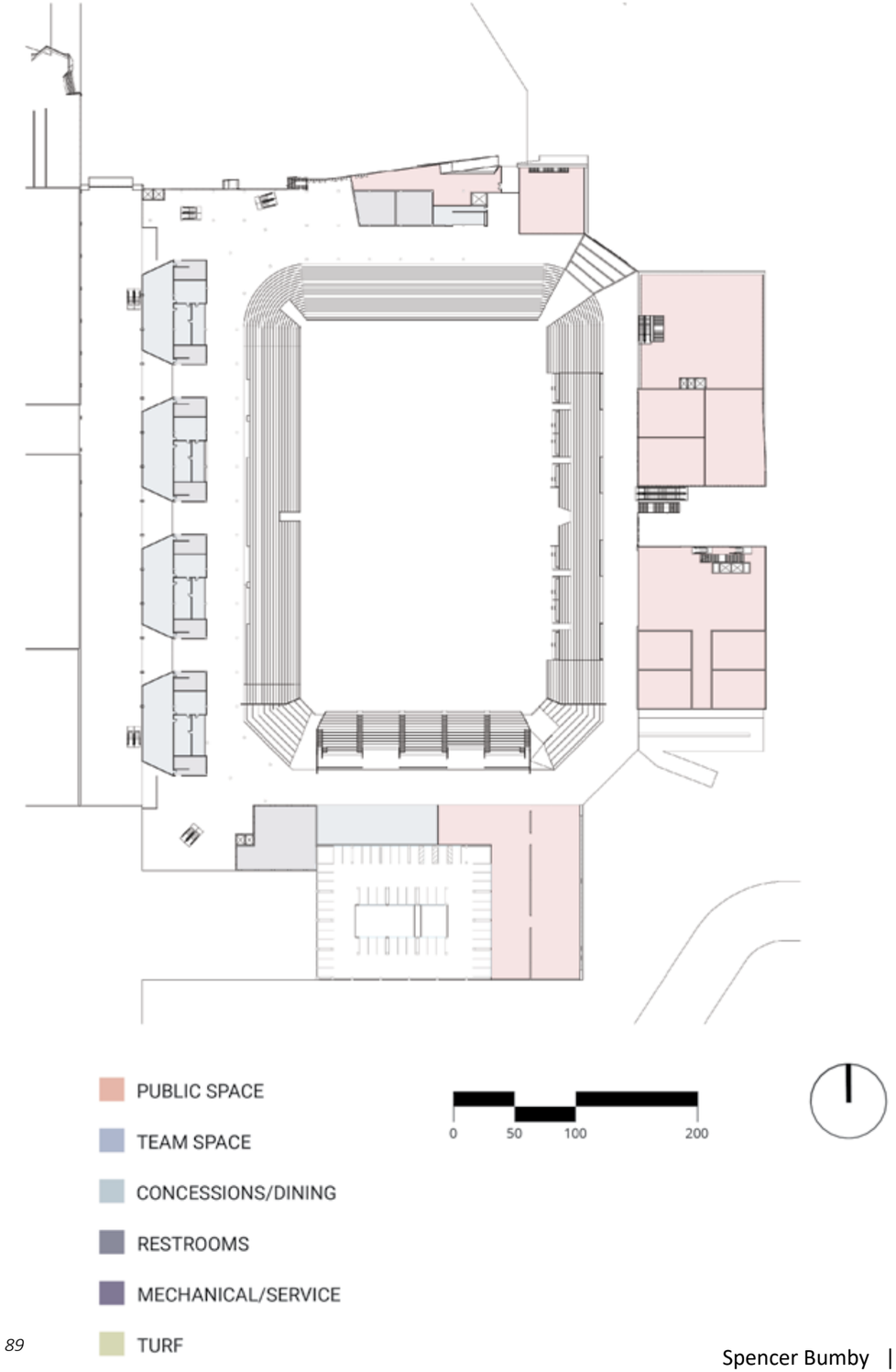


Figure 89

Upper Concourse Level Floor Plan

South End Stadium and Development

Description

Compared to the other levels of the stadium seen, the upper concourse level is the level that most represents a typical stadium layout. Where the seating bowl is located, there are vomitories at the bottom of the bowl that serve as the primary access point between the upper level seats and the upper level of the stadium. In the case of the South End Stadium upper deck, it is only located on the north and west ends with an entry and circulation spaces in the southwest corner of the stadium.

Similar to many stadiums, the concession stands and the restrooms are grouped together to create a more unified circulation pattern while the game goes on. The entrances that allow a ticketed guest to either enter or exit the upper level concourse lie within either the grand hallway to the west or the gameday plaza to the north. Knowing that these two spaces were easy to draw guests and to have waiting areas, they were ideal for hosting circulation.

Looking at the eastern buildings, the red highlights the Movie Theater concept as well as the Premium Seating Tower. Within the theater, it will operate just like any other given urban Movie Theater for 300+ days a year. However, on gamedays, the western theaters will have walls retract into the ceiling to create a large, enclosed stadium suite fitted with oversized seating, expansive views, and deluxe dining options.

- Upper Bowl Seating
- Residential Building
- Office Building
- Concessions
- Hotel Rooms + Lounge
- Restrooms
- Movie Theater
- Premium Seating Tower

Figure 90

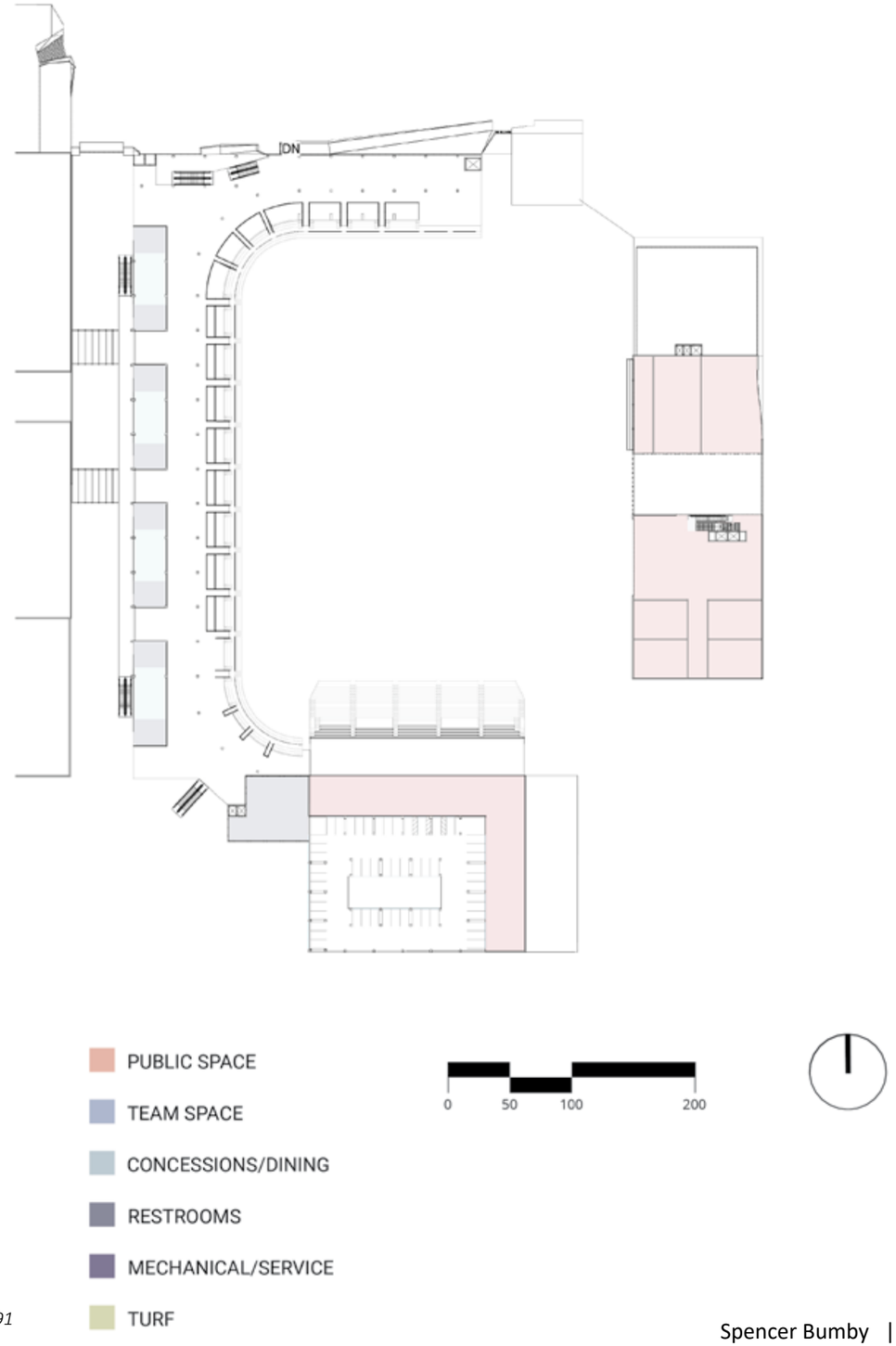


Figure 91

Suite Level Floor Plan

South End Stadium and Development

Description

Located at the top of the upper seating bowl, the suite level is the location of the primary premium seating areas within the stadium. The suites were designed to be facing east toward the action to best avoid direct sunlight interfering with the spectator's views during a standard game. Knowing that most games occur after noon, the sunlight would not be an issue. Placed in the northwest and southwest corners of the suite level are the bars and concessions that will primarily serve those in the standing room areas and club seating areas.

Looking at the Hotel that takes up most of the southern end of the stadium, the current hotel footprint takes an L-shape that hugs the parking garage running up along three stories of the building. On the southern wing of the hotel, the rooms are relatively standard. On the north end of the hotel, however, the rooms are designed for the optimum sports experience for soccer and football fans near and far. Equipped with a standard bed configuration, the rooms will also feature an expansive living room with multiple soft seating options and a large window with direct views into the stadium. With this experience already built into the hotel room, the rooms will sell at a higher price in lieu of the fan having to buy a ticket to enjoy the game inside the stadium.

- Upper Bowl Seating
- Residential Building
- Office Building
- Concessions
- Hotel Rooms
- Standing Room Areas
- Restrooms

Figure 92

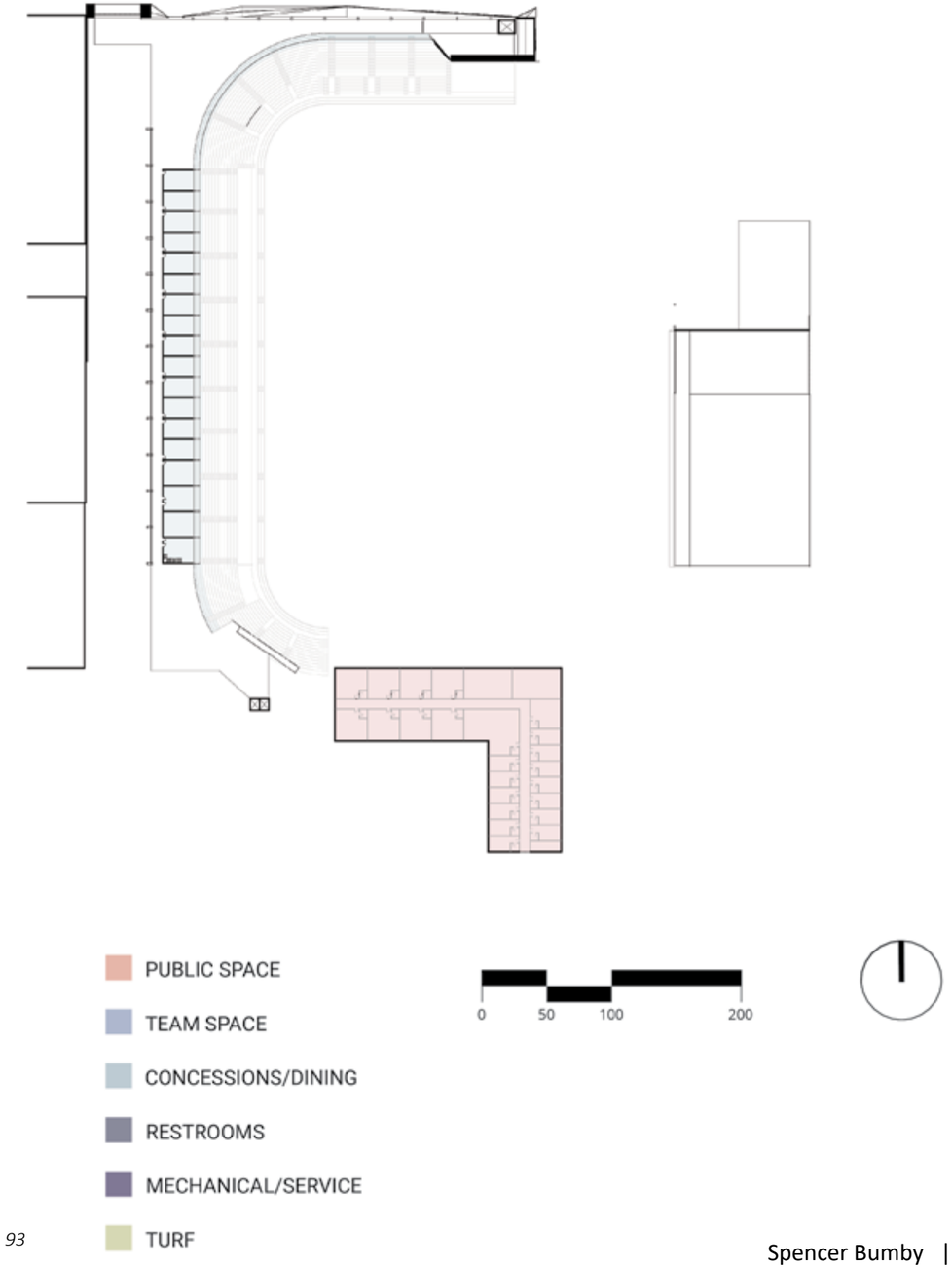


Figure 93

Stadium Seating Chart

South End Stadium

Description

Looking at the seating arrangement, the South End Stadium has seating on all four sides of the field in the lower bowl. Within the lower bowl, there are also premium tabletop seats located in the southeast and southwest corners. On the eastern end of the field, there are field level seats that are directly connected to a lounge underneath the seating bowl. Similar to most newly constructed MLS Stadiums, there is a safe-standing seating section located on the south end that is designed specifically for the New England Revolution supporters club.

In the upper bowl, the seating is mostly located on the western end with some seating wrapping around the western corners and a few sections on the north end. Capping the northern end of the concourse is a large patio area that has movable seating. By placing movable seating instead of permanent landscaping, the area can be redesigned as necessary and is capable of moving to allow for more fans to use the standing room. The majority of the suite seats are located on the top of the upper bowl and take up the last two to three rows of seats. The other suite seats are located on the opposite end of the stadium and are converted into a suite from a movie theater.

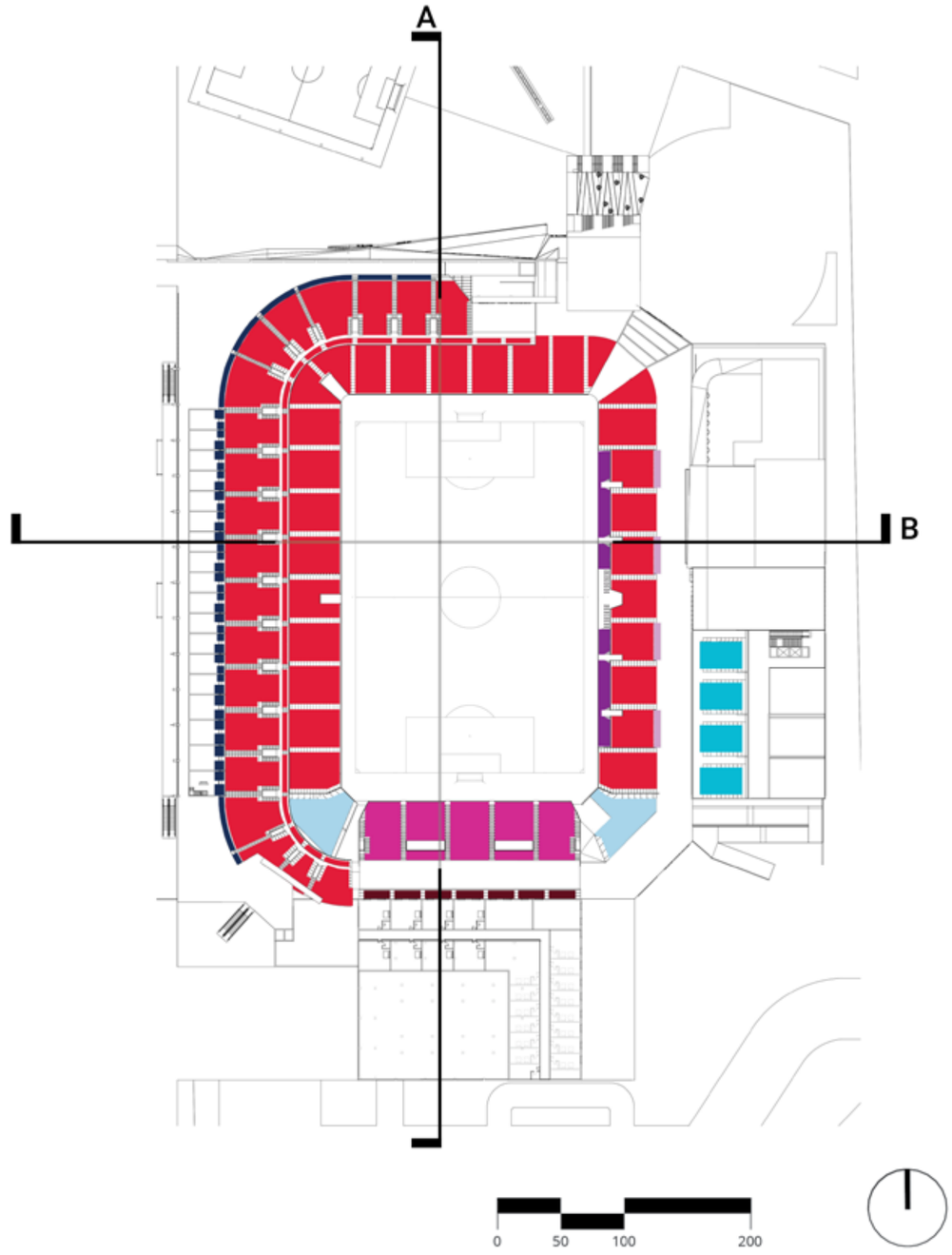


Figure 94

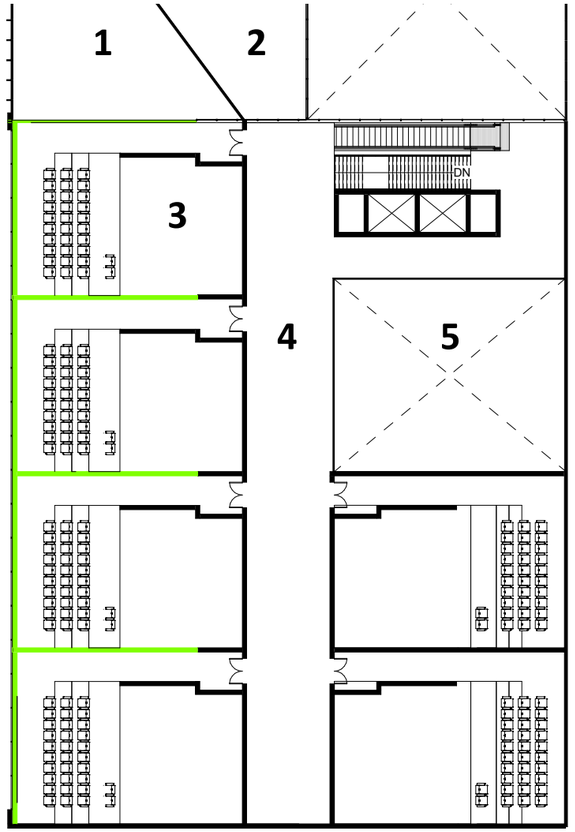
Movie Theater/ Stadium Suite Concept

South End Stadium and Development

Description

One of the concepts proposed in this stadium to create more year round revenue was a movie theater directly connected to the stadium. At the event level, there is a small lobby facing Dorchester Avenue that allows the public to access the lobby regardless of what sporting event could be happening inside of the stadium. On the concourse level, the primary movie theater lobby connects directly to the main concourse, allowing more of the public to access it during a non-gameday. Along with the primary lobby, this level features four theaters on the south end of the building.

Looking at the upper concourse level, which has a floor plan shown to the right, the right side of the movie theater is the vertical circulation area, an overlook, and two standard theaters. On the left side of the building are four theaters, with their screen walls and dividing walls highlighted in green. They are highlighted in this color to represent that they are retractable walls, a technology made possible using the Zenith Skyfold series walls. By using this system, the walls can retract up into the ceiling or rest on a staircase and effectively divide the theaters both acoustically and visually. When all of the walls are retracted, the theaters are open to expansive views of the stadium. Equipped with oversized seats and food and beverage amenities, the open concept creates a prime premium seating experience for any sports fan.



1 - FLEX SEATING SPACE

2 - FLEXIBLE USE AREA

3 - MOVIE THEATER (TYP.)

4 - MAIN HALLWAY

5 - LOBBY SPACE BELOW

0 20 40 80

Figure 90

Figures 95-96

Retractable Seating and Hill

South End Stadium

Description

In order to make the use of the stadium as a public park successful, there needed to be an ability to either remove or retract portions of the seating. Knowing that the seats would only be needed for 30+ days a year, it would be ideal to have them removed and prevent unnecessary damage to the seats that would create any issues during the gameday experience.

Using a retractable bleacher system, similar to what was done at U.S. Bank Stadium, the west and south seats would be semi-mechanically retracted into a storage space that sits underneath the concourse. Once they are in a stored position, the bleacher system can be covered and a ramp could be brought in. This ramp would be a mechanical hydraulic lift system with the top piece being made up of a grass system. By having this mechanical system moved in place, there is then a seamless transition between the open grass field on the event level and the concourse level. While the upper bowl seating is not capable of being retracted, the seats could be covered using large panels similar to what is being done at the Mercedes Benz Stadium. Considering that these panels would be anywhere between 20 and 40 feet tall, they would be able to be used for advertisement, branding, and local artwork to better engage the public with the partially unused upper bowl.

1

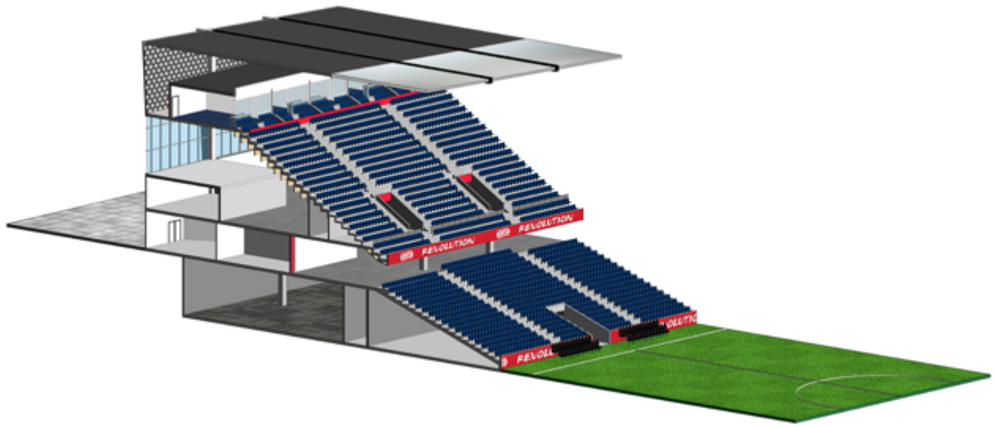
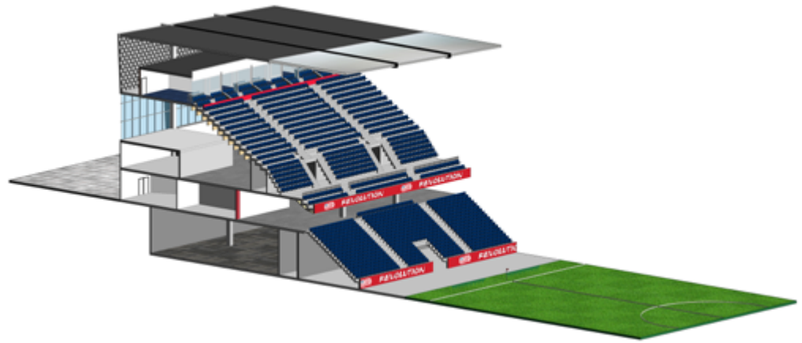
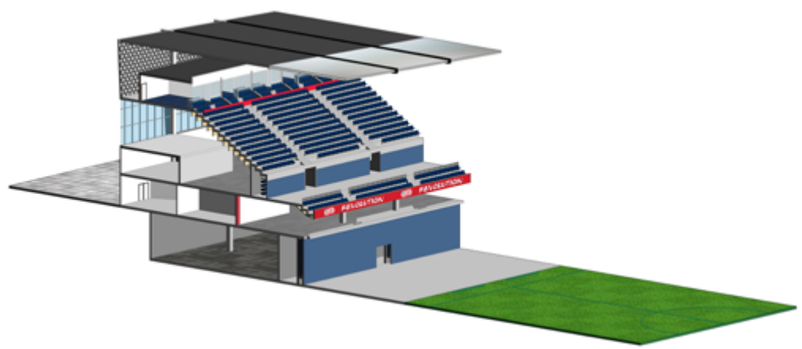


Figure 97

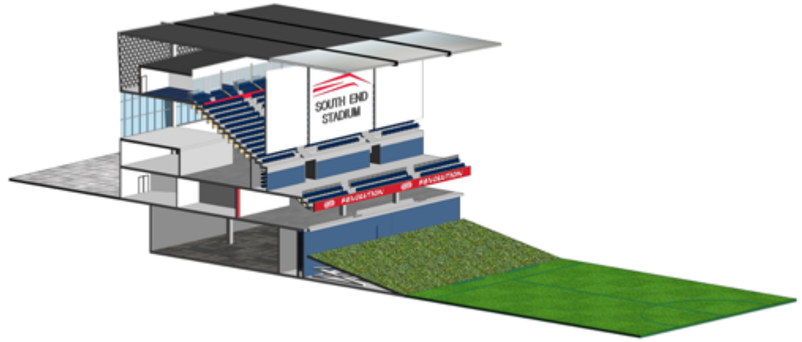
2



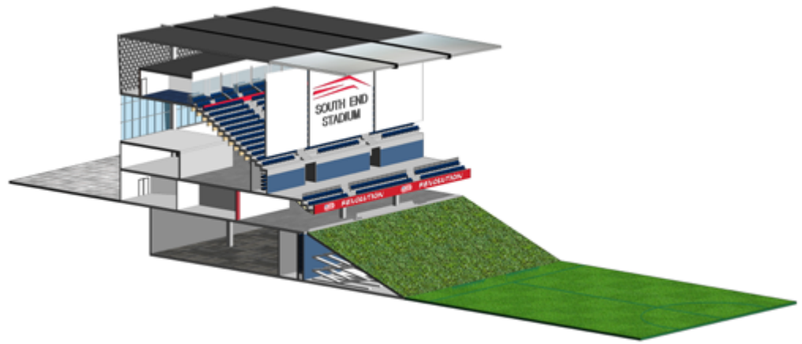
3



4



5



Figures 98-101

Final Renderings

South End Stadium and Development

Description

The first set of final renderings look at the South End Stadium from inside of the hotel. From this view, most of the seating bowl is able to be seen and the views of the Downtown Boston skyline are very present. This set of renderings aims to show the multiple functions that the stadium was designed to hold effectively, with multiple sports and public programs. In the case of the four below, we see a Farmers Market on the bottom left corner with the right three showing Soccer, Hockey, and Football.

The transition from a sporting venue into a Farmers Market is relatively simple, with the largest conversion being the sporting turf having to retract into the storage space underneath the seating bowl. Once that process is done, the community is able to bring in food trucks, tables, kiosks, and stands as necessary by using either a truck or any other vehicular transport.

Figure 102

Figures 86, 103-104

Final Renderings

South End Stadium and Development

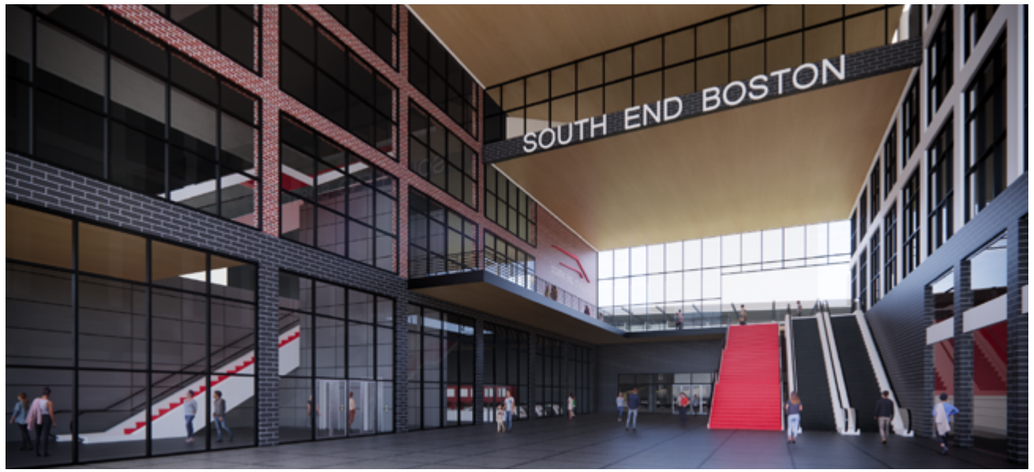
Description

The second set of final renderings look at the public areas of the South End Development that will be some of the most visible areas in the project. On the bottom left corner of the age is a rendering that shows the development's overview looking south. From one of the primary pedestrian entrances the stadium remains highly visible and creates a large opening that allows the public to be able to see inside of the stadium. Even through the design the architecture intends to point the general public towards this large entrance.

On the top right corner is the rooftop patio, a large open event space that can be rented out for private events any time during the year. The rooftop space provides a sweeping view of South End Stadium, Downtown Boston, and parts of Back Bay. Below that rendering in the center is the Hub on Dorchester, the hub of the development and most of the public spaces. The central hallway provides direct access to both the stadium and the field level suite below. On the left hand side is the movie theater complex and a public bowling alley with the right side hosting a large supermarket as well as office space above. This office space could be rented, but most of the space will be the home of the New England Revolution staff and their offices.

The bottom right rendering highlights the only facade for the stadium within the development. By using the LED lighting systems and semi-transparent panels, the stadium begins to create a highly visible brand for itself to the public. This facade faces north, exposing itself to traffic from the interstate, downtown, and most pedestrians that would be come to the site using public transportation.

Figure 105



Figures 106-108

Figure 109

Bibliography

Arquitectonica. (n.d.). Inter MIami CF Stadium. Inter MIami CF Stadium and Miami Freedom Park. MIami, Florida.

Cardinal, B. (2016, September 1). The Modern Olympic Games - 1896, 2016 and Beyond: Can Elite Sport Spectacles Incite Movement among the Masses, or Do They Merely Foster Spectatoritis? Journal of Physical Education, Recreation & Dance, pp. 5-8.

ESPN. (2019). MLB Attendance Report. Bristol, CT: ESPN.

Guillot, C. (2013, July). The ALL-PURPOSE EVERYTHING-YOU-WANT-IN-ONE-PLACE Sports Stadium. Planning, pp. 18-26.

HKS, I. (2012). Rams 2012 Plans: Conceptual Design. St. Louis: St. Louis Convention & Visitors Commission.

John, G., & Sheard, R. (2000). Stadia: A Design and Development Guide. Woburn, MA: Reed Educational and Professional Publishing.

Keer, B. (2018, August 4). CMX Cinemas OId Orchard Review - A New Concept. Retrieved from Splash Magazines Chicago: https://chicago.splashmags.com/index.php/2018/08/04/cmx-cinemas-old-orchard-review-a-new-concept/#gsc.tab=0

Minnesota Legislature. (2020). Basketball in Minnesota and the Target Center Arena. St. Paul, MN: Minnesota Legislature.

Nobles, J. (2017). Comparison of Selected Governance and Operations Issues at Minnesota Sports Facilities. St. Paul, MN: Office of the Legislative Auditor, State of Minnesota.

O'Malley Greenburg, Z. (2009, April 14). America's Best Baseball Stadiums. Forbes, p. 1. Retrieved from Forbes.

Rutes, W. (2001). Hotel Design, Planning, and Development. New York: W. W.Norton & Company.
Saporta, M., & Wenk, A. (2014). Atlanta Falcons stadium's cost will 'rise up' to $1.4 billion. Atlanta Business Chronicle, 1.

Schneider, K. (2020, June 30). As Major League Soccer Expands, Teams Are Getting New Homes. New York Times. Retrieved from New York Times.

Skyfold. (n.d.). Zenith Series Vertically Folding Partition Walls. .

Zimbalist, A., & Noll, R. G. (1997, June 1). Sports, Jobs, & Taxes: Are New Stadiums Worth the Cost? Brookings.

Reference List, Photography

(Back Bay, Boston) Retrieved October 6, 2020
https://tobyharriman.com/wp-content/uploads/2018/07/Back-bBy-Boston-Aerial.jpg

(Downtown Boston) Retrieved October 6, 2020
Osman Rana, https://images.unsplash.com/photo-1501979376754-2ff867a4f659?ixlib=rb-1.2.1&ixid=eyJhcHBfaWQiOjEyMDd9&auto=format&fit=crop&w=1350&q=80

(Downtown Boston) Retrieved October 6, 2020
https://tobyharriman.com/wp-content/uploads/2018/07/East-Boston-Waterfront-Aerial-Sunset.jpg

(Financial District, Boston) Retrieved October 6, 2020
Alex Iby, https://unsplash.com/photos/cNgsAdd4-m4

(Waterfront, Boston) Retrieved October 6, 2020
Lance Anderson, https://unsplash.com/photos/NrDYqseeAxk

(Miami Freedom Park) Retrieved October 4, 2020
https://arquitectonica.com/architecture/wp-content/uploads/sites/2/2019/04/intermiami-stadium-miami-freedom-005-1920x1080.jpg

(Miami Freedom Park) Retrieved October 4, 2020
https://arquitectonica.com/architecture/wp-content/uploads/sites/2/2019/04/intermiami-stadium-miami-freedom-004-1920x1080.jpg

(Hubert H. Humphrey Metrodome) Retrieved September 12, 2020
https://tobyharriman.com/wp-content/uploads/2015/09/Downtown-Boston-Aerial-Photography-1.jpg

(Target Field) Retrieved September 12, 2020
https://ballparkdigest.com/wp-content/uploads/2019/05/targetfield2019-6.jpg

(U.S. Bank Stadium) Retrieved September 12, 2020
https://jlgarchitects.com/wp-content/uploads/2018/06/f3c0b690cf19d09e89f9ceba2561dcd3.jpg

(Target Center) Retrieved September 12, 2020
http://www.alliiance.us/wp-content/uploads/2015/05/site-map-complete.jpg

(Banc of California Stadium) Retrieved October 2, 2020
https://soccerstadiumdigest.com/wp-content/uploads/2017/05/LAFCmay20-1.jpg

(Banc of California Stadium) Retrieved October 2, 2020
https://www.bancofcaliforniastadium.com/media/1092/bancstadium_concertaerial.jpg

(Banc of California Stadium) Retrieved October 8, 2020
https://la-mp7static.mlsdigital.net/elfinderimages/Photos/Stadium/Clubs/SunsetDeck/SunsetDeck_1920x1080-4.jpg

(Banc of California Stadium) Retrieved October 8, 2020
https://soccerstadiumdigest.com/wp-content/uploads/2017/05/LAFCmay20-2.jpg

(Fenway Kenmore, Boston) Retrieved November 23, 2020
Alex Iby, https://unsplash.com/photos/Nb-KiMNgJTc

(Soccer Stadium) Retrieved December 2, 2020
Thomas Serer, https://unsplash.com/photos/r-xKieMqL34

The Battery Atlanta) Retrieved September 13, 2020
https://www.nelsonworldwide.com/wp-content/uploads/2019/11/the-battery-02.jpg

(CMX Theatre Lobby) Retrieved October 7, 2020
https://www.splashmagazines.com/wp-content/uploads/2018/08/CMXChicagoOldOrchardforMedia-5841.jpg

(CMX Theatre Seating) Retrieved October 7, 2020
https://www.splashmagazines.com/wp-content/uploads/2018/08/CMXChicagoOldOrchardforMedia-5878.jpg

(CMX Theatre Market) Retrieved October 7, 2020
https://www.splashmagazines.com/wp-content/uploads/2018/08/CMXMarket-Market-Area-1.jpg

(Toronto Marriott City Centre Hotel) Retrieved October 6, 2020
https://bostonglobe-prod.cdn.arcpublishing.com/resizer/OXlKtWInxZisAbE1ZblTgjvZ0sM=/1440x0/arc-anglerfish-arc2-prod-bostonglobe.s3.amazonaws.com/public/JXJFPDER64I6TKMT3LLT5Y6CRY.jpg

(Surly Brewing Co. Beer Hall) Retrieved October 8, 2020
https://i2.wp.com/absolutebeer.com/wp-content/uploads/2019/11/AB-Breweries-Surly-Brewing-Co-Taproom-1.jpg?fit=1800%2C1200&ssl=1

(Tottenham Hotspur Stadium) Retrieved October 8, 2020
https://populous.com/wp-content/uploads/2019/04/AD1I4543_20191002505278 72-scaled-e1582294146228.jpg

(Neighborhoods of Boston) Retrieved September 17, 2020
https://cdn10.bostonmagazine.com/wp-content/uploads/sites/2/2015/08/bostonneighborhoods2.jpg

(Widett Circle Site Map) Retrieved September 10, 2020
https://www.mass.gov/doc/chapter-1-introduction-and-project-summary/download

(Soccer Stadium, Germany) Retrieved October 10, 2020
https://unsplash.com/photos/7gc5g8clNUE

(MBTA Red Line, Boston) Retrieved October 10, 2020
https://unsplash.com/photos/VadCi9b4hbo

(Downtown Boston) Retrieved October 10, 2020
https://unsplash.com/photos/sxnuzW9ZWu0

(Books) Retrieved October 26, 2020
Eli Francis, https://unsplash.com/photos/_M-DrbiNFa4

(Edward Jones Dome, St. Louis) Retrieved December 2, 2020
https://commons.wikimedia.org/wiki/File:Edward_Jones_Dome_(9721837046).jpg

(Baseball Stadium) Retrieved December 2, 2020
Jimmy Conover, https://unsplash.com/photos/SEQ2VI0KI6A

(St. Louis MLS Stadium) Retrieved December 8, 2020
https://league-mp7static.mlsdigital.net/styles/image_landscape/s3/images/stl-interior.jpg?g1dlosyEd_hwZXmIh5nvO6nrJuXtAE.p&itok=pp46CM_A&c=2ff324e56acc89ec191e6490d4d41140

(St. Louis MLS Stadium) Retrieved December 8, 2020
https://304ljw4amcep3ali496xph6b-wpengine.netdna-ssl.com/wp-content/uploads/2019/10/STL-MLS_GameDay-Concourse_1900.jpg

(Widett Circle Development) Retrieved March 11, 2021
https://www.thebostoncalendar.com/system/events/photos/000/050/877/large/Widett_Cirle.png?1445271701

(Widett Circle Development) Retrieved March 11, 2021
http://media.bizj.us/view/img/6325141/midtown-legacy-plan*1200xx1037-584-0-230.png

(Dorchester Ave Redevelopment) Retrieved March 11, 2021
https://i.imgur.com/epW9CaU.jpg

Spencer Bumby, LEED Green Associate

Dallas, Texas

[redacted]

Figure 110

Previous Design Studio Experience

**First four years completed at South Dakota State University*

1st Year:

Spring 2016: Diagramming Light, Sandbox | Robert Arlt

2nd Year:

Fall 2016: Stair Cubes | Federico Garcia Lammers

Spring 2017: Archaeology of Section | Jessica Garcia-Fritz

3rd Year:

Fall 2017: Passive House: BRK | Robert Arlt

Spring 2018: Fibonacci Grid House | Fang Xu

Berlin Townhouse | Fang Xu

4th Year:

Fall 2018: Aperture, Module, Gallery | Brian Lee

Spring 2019: Student Housing Complex | Fang Xu

5th Year:

Fall 2019: High Rise Capstone | Mark Barnhouse

Spring 2020: Marvin Windows Competition | Amar Hussein

Target Center Renovation | Amar Hussein

6th Year:

Fall 2020: Fenway Park Renovation | Lance Josal

Spring 2021: Design Thesis | Bakr Aly Ahmed