

**TAPITECTURE
DEFINING THE CENTER OF THE PHILADELPHIA SPORTS DISTRICT**

A Thesis

Submitted to the

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In partial fulfillment of

The requirements for the degree of

Master of Architecture

Department of Architecture

By

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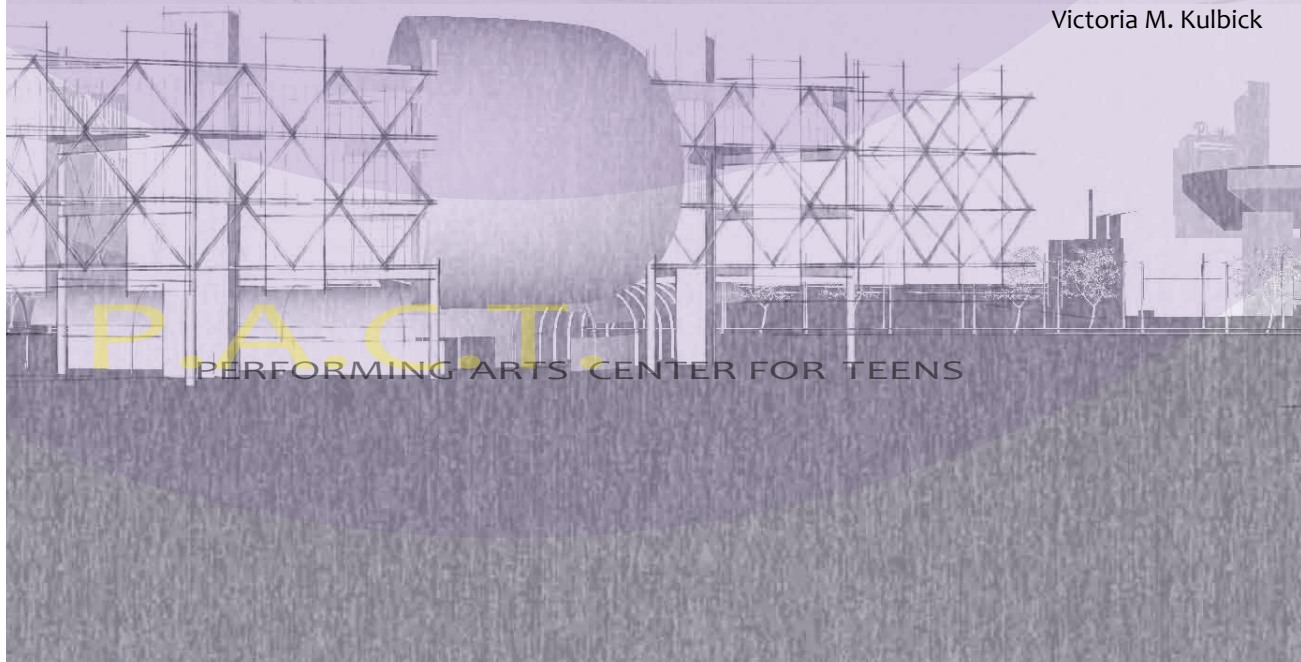
Reader _____
(*JE Elliot*)



DEFINING THE CENTER OF THE PHILADELPHIA SPORTS DISTRICT

How can the awareness of sonic architecture enhance the built environment?

Victoria M. Kulbick



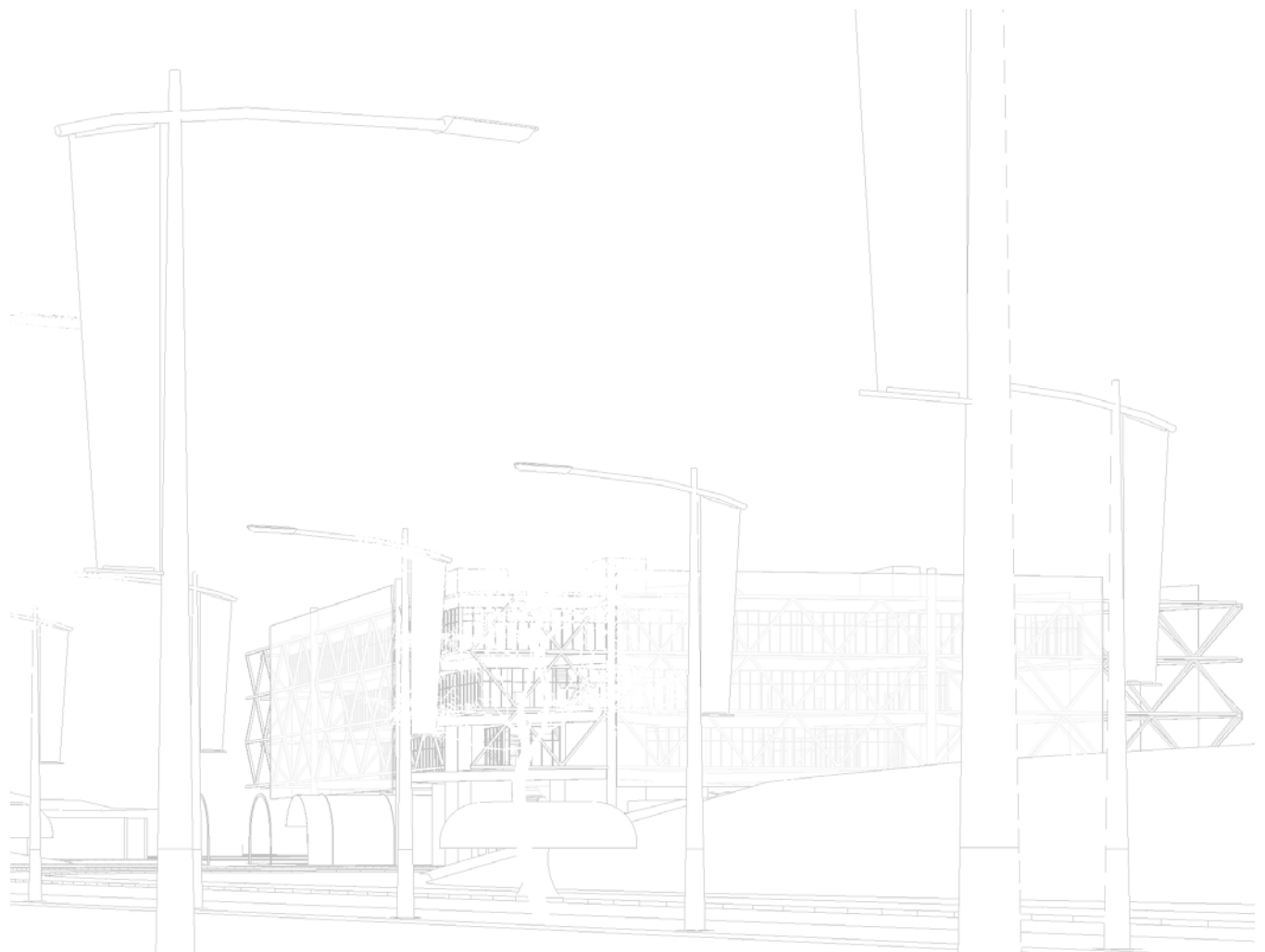


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WRITTEN THESIS DOCUMENT

Tapitecture: Sound as a Foreground Element of Design

Victoria Kulbick

ABSTRACT: Sound exists as a constant presence involved in and determining the shape of the world. It is used to define our perceptual, emotional, spiritual and psychological spaces; and contributes to our understanding of the self, the environment, and human relationships. The sonic environment extends from the most personal distances to the farthest distances at which sense data can be perceived and therefore requires the direct involvement of the individual. While architecture uses the visual sense to interpret the culture of a location, it may also consider the ways that sound can be used in design as a primary element. One known art form that uses sound as a primary element for interpretation is tap dancing. This essay discusses how architecture can use tap dancing as a precedent for designing based around the idea of sound. Through an exploration of the history, culture, and principles of tap dancing along with examining successful and unsuccessful uses of sound in architecture, the author's design proposition asks how architecture can employ the use of sound as a foreground element in the design of a place.

"Hearing represents the primary sense organ – hearing happens involuntarily. Listening is a voluntary process that through training and experience produces culture. All cultures develop through ways of listening."

– Pauline Oliveros¹

Introduction

What is noise? What is sound? Noise is the person in the movie theater talking during an important scene. It is the harsh surprise of a jackhammer as you pass a construction site. Noise is unwanted sound. But what types of sounds are "wanted"? What types of sounds do people tolerate? What sounds seem muted because of their constant presence? Sounds are events or experiences we often take for granted - the rustling of leaves as wind moves through trees, a distant rumble of thunder, the movement of people on a street below the open window of a city apartment. Sound is a rhythmic pattern of "air in motion".² As air moves through space, particles vibrate and move through the air, resulting in the sounds that are heard by the human ear.

Sound exists as a constant presence involved in and determining the shape of the world. It is used to define our perceptual, emotional, spiritual and psychological spaces; and contributes to our understanding of the self, the environment, and human

relationships. Without sound, the world would essentially be a stark, unchallenging, boring place to inhabit. While provocative shapes in architecture are used to visually interpret the culture of a space, sound also plays a crucial role in the way we experience the built environment. However, it is often true that the quality of sound within or created by a space is overlooked during the design process.

One known art form that takes the act of creating sound to compose specific rhythmic patterns is tap dancing. This form of dance is defined as "a form of exhibition dancing characterized by rhythmical tapping of the toes and heels".³ There is much more to tap dancing than special shoes with hard soles or metal plates attached to the bottom. This form of dance relies heavily on the rhythms and sounds created by the movement of the body. Can the principles of tap dance inform designers how to create a unique experience of sound in space?

Exploiting the Soundscape

The origins of tap dance in the United States date back to the late 1700s when forms of percussive dance appeared in the young country from such places as Ireland, England, Africa, and Scotland. The audience's experience of a tapper's performance, then and now, relied heavily on the sounds created by the dancer. Rusty E. Frank, a tap dancer, producer, and tap preservationist explains tap

as an “American art form” that evolved from the combination of these dance styles. She explains that the “spirit of tap” was taken directly from the daily life style of America formed out of the many ethnicities that filled the country.⁴

In *The Book of Tap*, dancers Jerry Ames and Jim Siegelman explain that “the American Tap-istry” began when slaves in the South used percussive dance to replace the use of percussive instruments on plantations. In the early 20th century, big cities of the North like Philadelphia, New York, and Chicago were cultural centers of the progression of the Machine Age as black and white Americans alike began to move into the city. An original street tap dancer, Lavaugh Robinson, said “Philadelphia bred tap dancers and prize fighters. It was just that everybody in Philadelphia *could* do it. ... People didn’t learn in no [tap] schools then. See, you learned right out on the street.”⁵ African dance and music that was a part of the culture and daily life of previously enslaved individuals aided their ability to take these urban rhythms and sounds and turn them into an art form. Early tap dancers would use their body and their feet to match the sounds that they heard in the city and bring their performance right out onto the street corners.⁶

The city was used by tap dancers to help create rhythmic body movements. This inherited soundscape, or “overall sonic environment of an area”⁷, not only adds to the character of the built environment, but also helps to define the context of the city. While tap dancers often embrace these sonic events – such as trains, car horns, and construction – as inspiration, architectural design often disregards these sounds as if they were non-existent prior to the construction of a building. While architecture and tap are visually stimulating, the human visual sense often distances the perceiver from their environment because they are not actively using their other senses to engage themselves in the experience of an object, a performance, a place, or a building. The sonic environment, in contrast, extends from the most personal distances to the farthest distances at which sense data can be perceived and therefore requires the direct involvement of the individual.⁸

Hearing is the means by which we are able to sense and visualize our surroundings through sound. When we use the active sense

of listening, we are interpreting what we hear in several ways. “The ability of human beings to sense space by listening is rarely recognized. But sensing spatial attributes does not require special skills – all human beings do it: a rudimentary spatial ability is a hardwired part of our genetic inheritance.”⁹

The existing soundscape of a place also adds to the character of our built environment. In “The Sonic Environment of Cities”, Michael Southworth discusses how people perceive space through an “exploratory study” of sounds in the city. A group of people was broken into three categories of even numbers: auditory, visual, and visual-auditory. All subjects were taken on a one-day walking tour and were asked to record their experiences of different locations that were visited for a prolonged period of time in the city of Boston, Massachusetts. Auditory subjects, who could not see and only hear, appreciated “unique and informative sound settings”. These spaces of memorable sounds inform people of the spatial quality as well as active character. Visual subjects were more appreciative of the areas that had stronger spatial form than activity or sound. Their selections have stronger visual than sound qualities because they could only experience their surroundings through site. Qualities of sound helped auditory and visual-auditory subjects to have a more pleasant experience in spaces that are less visually pleasing and therefore that the visual subjects found to be uninteresting.¹⁰

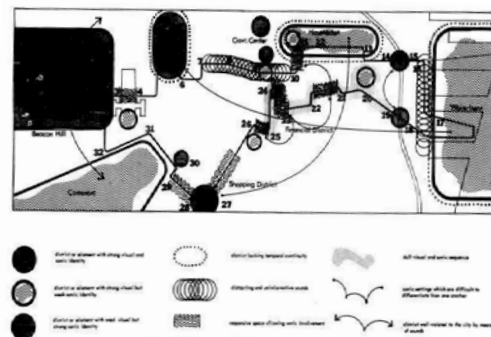


Fig 1: Evaluation of the Boston soundscape taken from “The Sonic Environment of Cities”

Southworth's study of Boston suggests that the visual experience of the built environment is closely related to the sounds that accompany it. What we can learn from this examination is that the soundscape of an environment directly affects the emotional experiences of a place, enhancing or decreasing delight. Southworth names three form elements that would take advantage of this relationship between sound and place: large open spaces, small sonically responsive spaces, and sonic signs.¹¹ These elements will be examined later in this article through both a small-scale and large-scale study of Philadelphia.

Sound as a Foreground Design Element

The African American community began the popular traditions of jazz, "big band swing", tap and other similar art forms to celebrate the transition from life in the South to life in the big cities. Tap dancing "best reflects the cultural hunger for an energized, revitalized, motorized body-in-motion" during the Machine Age of the early Twentieth Century.¹² African American art of the 1920s and 1930s took the African tradition of translating the surroundings and occurrences of everyday life into forms of entertainment. Jazz music and tap dancing brought the rhythms of the city to the stage. One of the centers of this cultural movement was Harlem in New York City. Located north of Central Park, Harlem served as the hub of African American culture in the 1920s and 1930s – being the home of a number of famous African American writers, poets, and performers.¹³ It was in the forty nightclubs, dance halls, and theaters of Harlem that tap began to rise in popularity among African Americans and White Americans alike.

As tap became increasingly popular in the early twentieth century, it began to transition from an African-American art form on stage to a major motion picture staple made famous by white actors and dancers like Fred Astaire, Ginger Rogers, Gene Kelly, and Shirley Temple, and a select number of African-American performers like Bill "Bojangles" Robinson. Music and dance during this period was a form of expression and a way for the realities of the world to be brought to the surface in an upbeat, comical manner. Performers like Astaire, Rogers, and Kelly used tap in combination with elements of ballet dancing to refine its "street quality". The style

of tap dance found in these films incorporated the upper body posture and movement of ballet with quick rhythmic movement of the feet.

In a scene from the film *Shall We Dance* starring Fred Astaire and Ginger Rogers, Astaire performs an energetic dance number to the Gershwin classic, "Slap That Bass". He dances in the engine room of a ship liner on its way to London, interacting with the heavy machinery surrounding him. Astaire mimics the sounds of the machinery and then increases the speed and rhythmic patterns of his feet. Though the primary factor behind this dance is to provide an energetic routine for entertainment, the underlying implications of the scene appear in Astaire's interactions with the numerous pistons chugging and churning around him. This continuous interaction of mimicking and then besting the machine is done to prove that the machine can never exceed the energy of a human.¹⁴



Fig 2 (top): Fred Astaire in "Slap That Bass" from *Shall We Dance*

Fig 3 (bottom): The Nicholas Brothers in "Jumpin' Jive" from *Stormy Weather*

The Nicholas Brothers established a more rhythmic style of tap dancing that Fayard Nicholas referred to as “classical tap”. Fayard and Harold Nicholas were young African American brothers who began performing tap at an early age in the mid-1920s while growing up in Philadelphia. In a performance with Cab Calloway to the song “Jumpin’ Jive” from the motion picture *Stormy Weather*, the Nicholas Brothers provide the percussion for the club band. While their high-energy performance is visually stimulating, the pair is much less concerned with posture and precise movement of the body than Astaire in “Slap That Bass”. The two are rarely in synch with one another, carrying their upper bodies and arms very differently – each brother dancing with his own personal style while executing the same dance steps. The two move all over the dance floor and stage with little to no regard for their appearance – arms and legs moving in different directions while their hands and facial expressions add character to their movements.¹⁵

The most important product of the performances in “Slap That Bass” and “Jumpin’ Jive” is the tap sounds created by the dancers movements. In tap, sound is the core element of choreography. While each performer has a different way of presenting himself through his body movements, the produced rhythms are always the most important products. Astaire often performed a cappella over the radio so listeners could experience his performance without actually watching him dance on film or on stage. In fact, tap performances were originally judged based on the sounds created by the dancer without seeing the feet move. Judges would sit beneath the stage to correctly evaluate dancers movements without visually experiencing their performance.¹⁶ Though the visual qualities of tap aid its success, it is no less rewarding when heard but not seen. How can architecture employ the use of sound as a foreground element in the design of a building to create more dynamic, more interesting, and more personal experiences?

Developing Aural Architecture

The human senses serve to stimulate our minds, triggering memories, emotions, and reactions. What we experience aurally enriches what is visually presented. The term aural refers to the human experience of a sonic process. In *Spaces Speak: Are You Listening?* by Barry Blesser and Linda-Ruth Salter, aural architecture is defined as “the properties of a

space that can be experienced by listening”.¹⁷ All architecture has an aural quality that is created intentionally or unintentionally based on a number of aspects including, but not limited to, materials used, the height of a space, and the angle of enclosing planes. This aural architecture is not strictly based on the acoustic quality of space. Acoustics is “the science of sound, and the phenomena of hearing”¹⁸ that deals with the production, control, transmission, reception and effects of sound. While acoustical design is important when implemented in the design of lecture halls, theaters, concert venues, and other similar spaces, consideration of acoustics and the use of sound in other buildings are rarely considered in design.

In “Hearing Architecture” from *Experiencing Architecture*, Steen Eiler Rasmussen describes how designing for sound can enrich the experience of a building. Rasmussen examines how buildings and spaces of the Renaissance period, churches in particular, were designed as instruments that were used to enhance the music during ceremonies. Sermons and readings were given in rhythmic patterns to capitalize on the acoustics of the space, creating a type of atmosphere defined through the use of sound. Rasmussen implies that contemporary architecture has become less concerned with sound when he states, “There was no longer any personal conception behind the rooms the architect planned and therefore he gave as little thought to their acoustic function and acoustical effect as to the texture of the materials he used.”¹⁹ Rasmussen believes this “indifference” to the materials used also led to a similar feeling about the way that sound is created and reflected through a space.²⁰

Christopher Janney, an architect and jazz musician, combines both disciplines to create what he calls “sound sculptures”. By incorporating the use of sound and light into a number of design installations, Janney has begun to introduce a new type of architectural experience. In an interview with Scott Simon from National Public Radio, Janney says, “I think that the general idea as an architect is to add another layer of material within space.”²¹ The intention of Janney’s work is to make public spaces “continuously refreshing” and to “make architecture an event, not just a building”.²² At Logan Airport in Boston, Massachusetts, Janney has designed a “sound sculpture” for the airport’s central parking. This project, entitled “The Sound Environment

of New England”, includes two nine-story towers of colored glass that transmit the familiar sounds of New England. Eight different sound environments fill the different parking levels. As you approach the elevators that will take you to the different terminals, the sounds transition to different instruments indicating the call of the elevator.²³

The implementation of sound in the design of a building or place can be used in a number of different ways. A particular instance of sound, like a fountain, can be used to mask unwanted noise, like an air conditioning unit. Sound can also be used in design to suggest or encourage movement through a space. In the United Airways Terminal at O’Hare Airport in Chicago, Illinois, Helmut Jahn uses abstract electronic sound and neon light to encourage movement of people through transitional space.²⁴ In other projects, including those by Christopher Janney, sound can also be used as an element of stimulation that makes a visually mundane space continuously new.

Categories of Sound

Sound can be placed into a number of different categories, which makes analysis of this topic very complex. For the sake of this study, I have created three general categories of sounds: natural, unwanted, and intentional. Natural sounds include what we hear due to the environment of a place. For example, the natural sounds of a forest would be the chirping birds, rustling leaves, and the call of animals inhabiting the area while the natural sounds of the city include car horns, construction, and the conversations and shouts of people moving along sidewalks. Unwanted sounds are those sounds that either intentionally or unintentionally disrupt ones experience of a place in a negative way. Intentional sounds are those sounds that are created purposefully either by designer (in the case of Christopher Janney) or the user.

In the following section, these categories of sounds and the form elements developed in Michael Southworth’s study of Boston will be applied to two case studies. The first examines the city on a small scale, looking specifically at the popular area known as South Street in Philadelphia. The second case study explores the soundscape of Philadelphia as a whole.



Fig. 4: Image of South Street, Philadelphia taken August 12, 2009.

Case Study One: South Street, Philadelphia Pennsylvania, USA June-August 2009

As a cultural hub of the arts in Philadelphia, South Street proved to be an interesting study of the influence of the soundscape of the city on the culture of a specific area. South Street is a major tourist destination in Philadelphia, bringing many different characters to the area because of its eclectic collection of restaurants, shops, and entertainment spots. In June, July, and August of 2009, I visited the stretch of South Street between Front Street and Seventh Street a number of times. I had been inspired to take my research here because of its “bohemian” atmosphere and its popularity amongst Philadelphians and tourists alike.

In the morning, the street is very quiet, most shops do not open until eleven, and the lack of office buildings limits both vehicular and pedestrian traffic during the early morning hours between eight and ten-thirty. The natural city sounds that filled the area during this time were generated by the distant traffic of I-95, which runs parallel to Front Street and carries commuters and travelers from Virginia up to New York.

As street life began to develop more strongly during the approaching lunch hour, the natural sounds begin to take on more typical “city” characteristics – conversations between pedestrians fill the sidewalks combining with the rhythmic sounds of tires rolling on asphalt. Unwanted sounds include

harsh car horns calling out warnings to pedestrians or other vehicles as well as a distant jackhammer. The sound of car horns is not only unwanted but intentional and serves as a sonic sign because it is used to warn people in the area of possible danger.

A small fountain in an open outdoor sitting space is littered with mothers and their young children, a few businessmen and businesswomen stopping to enjoy lunch outside, and a number of teenagers sitting and discussing the latest trends in fashion, music, and movies. This open space is an ideal testing ground for the addition of new and informative sounds that can be used to break the visual monotony of the space.²⁵ This space, known as Headhouse Square, could serve as an interesting location for a "sound sculpture" to introduce changes in daily experiences.

**Case Study Two:
Sound Study of Philadelphia
Pennsylvania, USA
August 12, 2009**

The initial study of South Street on June 12, 2009 led to an increased interest in the soundscape of Philadelphia on a larger scale. On August 12, 2009, I returned to the city of Philadelphia with a mapped out route of travel to record qualities of sound during the day. Beginning from the east end of South Street where it runs into Front Street, I traveled west noting the natural sounds of the city that were muted against the backdrop of such a vibrant area. Loud music was blasted through shop doors as I passed them, teenagers carried on animated conversations, and mothers gave strict orders to the young children at their sides.



Fig. 5: Image of Rittenhouse Square taken on August 12, 2009

Once reaching the intersection of South Street and Broad Street, my friend and I moved north along the "Avenue of the Arts", past a number of theaters and office buildings. This street in Philadelphia was much busier and the volume of conversation had to rise in order for my fellow traveler and me to hear one another. At Locust Street, we continued our traveling west until we reached the open space of Rittenhouse Square. Surrounded by high-rise residences, luxury apartments, restaurants, a bookstore, and two hotels, Rittenhouse Square was a popular place for city professionals and residents to gather during the afternoon lunch hours. Though set within the middle of the city jungle, the landscape of the park provided a peaceful atmosphere and its large size helped to diminish the harsh sounds of construction and traffic that plays such a crucial role in the city soundscape. The most distracting and unwanted noises that passed through the park as we sat on a bench in the center of the square were an ambulance driving around the perimeter of the park and a small golf-cart driven by a park maintenance worker.

We moved from Rittenhouse Square east along Walnut Street. Much different from both Broad Street and South Street, Walnut Street was not only noisy because of passing vehicular traffic but pedestrian traffic as well. Walnut Street is located centrally in Philadelphia and is therefore much more crowded during the afternoons than South Street. The narrow nature of the street and its tall buildings amplified the sounds from moving traffic and pedestrian conversation. We reached Washington Square, which has the same characteristics of Rittenhouse Square but is much smaller in scale and less densely populated by trees. We walked through Independence Mall, another area of land in Philadelphia that serves as both a public square and home to a number of tourist attractions, including the Liberty Bell. The sounds of this setting were much different than the others because of how many people filled the space. We continued our journey south at this point along Fifth Street which was much more quiet.

Discoveries made through Michael Southworth's study of Boston were affirmed during the Philadelphia sound study. Spaces like Rittenhouse Square, Washington Square, and Independence Mall were much more inviting to visitors and even suggested a chance to stop and relax for a few minutes.

Noises of distraction were dispersed and lessened which made them much more tolerable in these locations. South Street, Broad Street, and Walnut Street were visually striking, but noise from traffic kept people moving because of its alarming qualities. Along the streets, we were much more aware of our surroundings than when we were able to sit in the public squares.

Deriving Rules for Design

As the next stage of this study, I will be designing an architectural event, preferably in the city of Philadelphia, based on the research and discoveries that I have presented in this article. The first guideline is to incorporate the use of the three elemental forms created by Michael Southworth in "The Sonic Environment of Cities". By creating large open spaces that can change sonically over time, small sonically responsive spaces that can serve an intentional sonic event, and the use of sonic signs to inform those visiting the site, one can create a dynamic environment that can actively engage those using the space. Secondly, I hope to incorporate the use of the categories of natural and intentional sounds to help mask unnecessary and unwanted sounds of the city. The overall goal will be to use these loose guidelines in both an interior and an exterior setting.

Architecture is concerned with the design, arrangement, and manipulation of the physical properties of space. While the visual experience of the built environment is one of the most important elements of experiencing a space, the soundscape of that place plays an equally crucial role in this experience. Listening, as well as looking, must be made a part of design analysis and criticism. The tools of design must include media that can support sonic conceptualization and exploration. This need for incorporation of sound thus forces designers to determine the best ways to study, practice, and build the environment that we inhabit.

Endnotes

¹ Pauline Oliveros, "Quantum Listening: From Practice to Theory (to Practice Practice)" in *Cultural and Humanist in the New Millennium* (Hong Kong: Chinese University Press, 2003), 27.

² Leland M. Roth, *Understanding Architecture* (New York: Harper Collins Publishers, 1993), 91.

³ "Tap dancing" in *The Second Edition of the Oxford English Dictionary* (Oxford University Press, 2009).

⁴ Rusty E. Frank, *TAP!* (New York: Da Capo Press, 1994), 21.

⁵ Lavaughn Robinson, "Last of the Street Tap Dancers," in Rusty E. Frank's *TAP!* (New York: Da Capo Press, 1994), 129.

⁶ Terry Monaghan, "Narratives of Rhythm Tap," *Dancing Times*, 92 (2002): 21.

⁷ Jane F. Mastin and J. Douglas Porteous, "Soundscape," *Journal of Architectural Planning Research*, 2 (1985): 169.

⁸ *Ibid.*, 170.

⁹ Barry Blesser and Linda-Ruth Salter, *Spaces Speak, Are You Listening?* (Cambridge, Massachusetts: The MIT Press, 2007), 1.

¹⁰ Michael Southworth, "The Sonic Environment of Cities" in *Environment and Behavior*, 1 (1969): 49-65.

¹¹ *Ibid.*, 67.

¹² Joel Dinerstein, "Tap Dancers Rap Back at the Machine" in *Swinging the Machine* (Boston: University of Massachusetts Press, 2003), 221.

¹³ Steve Watson, *The Harlem Renaissance* (New York: Pantheon Books, 1995).

¹⁴ Mark Sanrich, "Slap That Bass" in *Shall We Dance* (California: RKO Radio Pictures, 1937).

¹⁵ Andrew L. Stone, "Jumpin' Jive" in *Stormy Weather* (California: Twentieth Century-Fox Film Corporation, 1942).

¹⁶ Monaghan, 21.

¹⁷ Blesser, 4.

¹⁸ "Acoustics" in *The Second Edition of the Oxford English Dictionary* (Oxford University Press, 2009).

¹⁹ Steen Eiler Rasmussen, "Hearing Architecture" in *Experiencing Architecture* (New York: The MIT Press, 1962), 235.

²⁰ *Ibid.*, 235.

²¹ Scott Simon, "Christopher Janney, Sculpting Sound," National Public Radio, <http://www.npr.org/templates/story/story.php?storyId=7584982>.

²² Ellen Lampert-Greaux, "Christopher Janney" *Theatre Crafts International*, 32: 1 (1998): 15.

²³ Simon,
<http://www.npr.org/templates/story/story.php?storyId=7584982>.

²⁴ Brian Walters, "Boeing places: Helmut Jahn has completed the 'terminal for tomorrow' for United Airlines at O'Hare airport," *Building Design*, 856 (1987): 30-33.

²⁵ Southworth, 68.

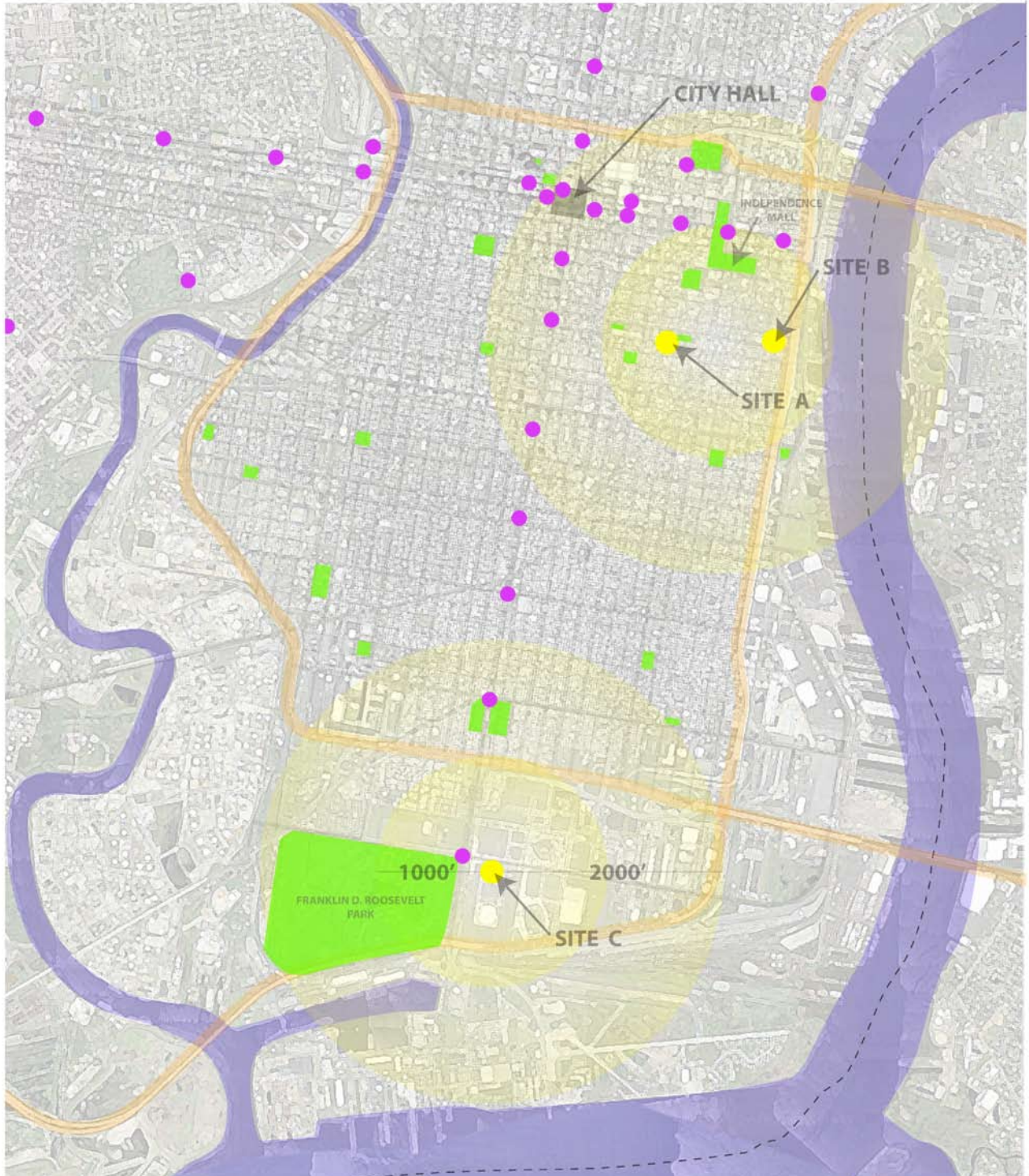


THESIS DESIGN DOCUMENTATION
ANALYSIS + DESIGN STUDIES

PHILADELPHIA GEOGRAPHY

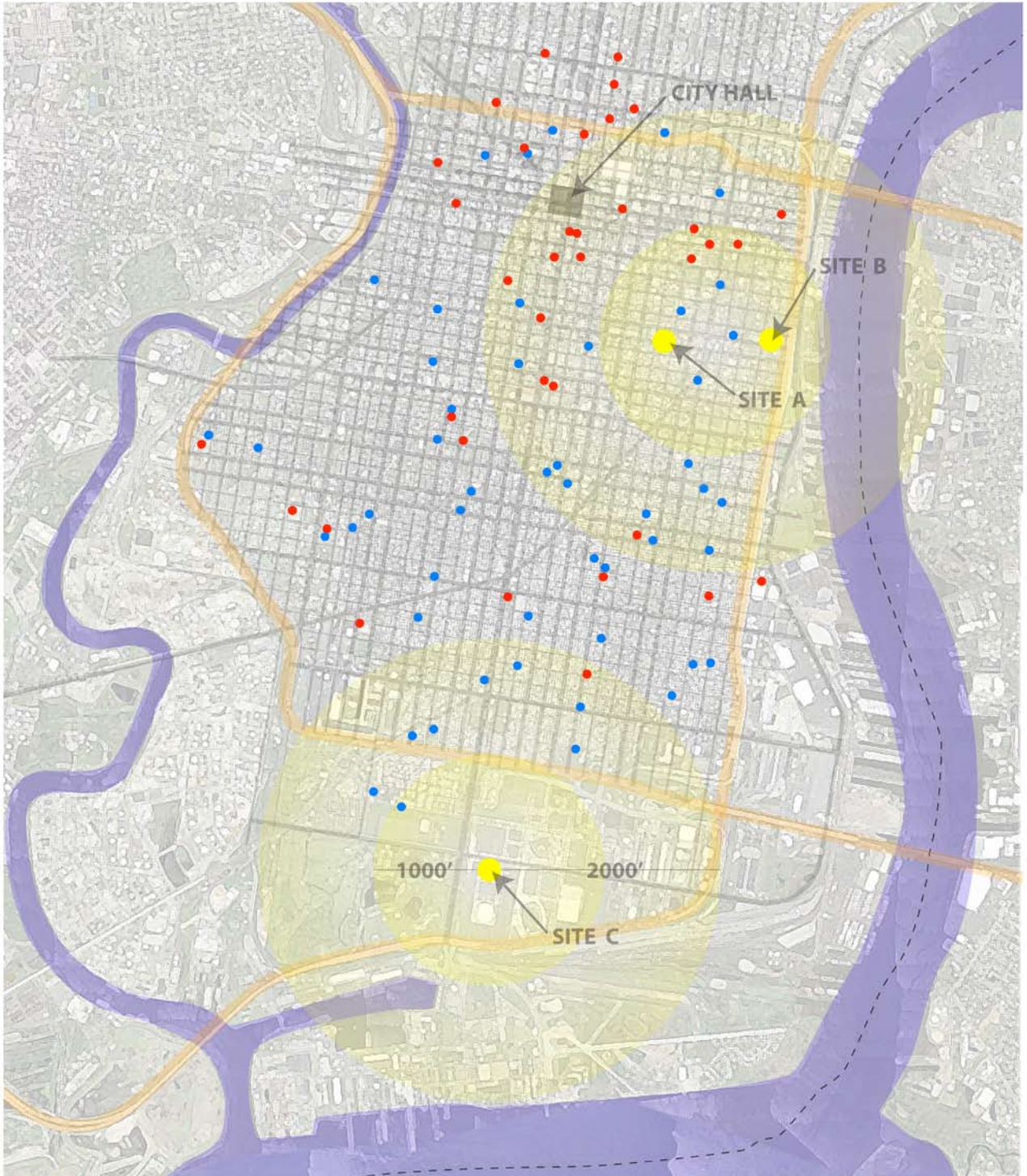
LOCATIONS OF GREEN SPACE and SUBWAY STATIONS

- SITE LOCATION
- GREEN SPACE
- SUBWAY STATIONS
- MAJOR HIGHWAY
- RIVER



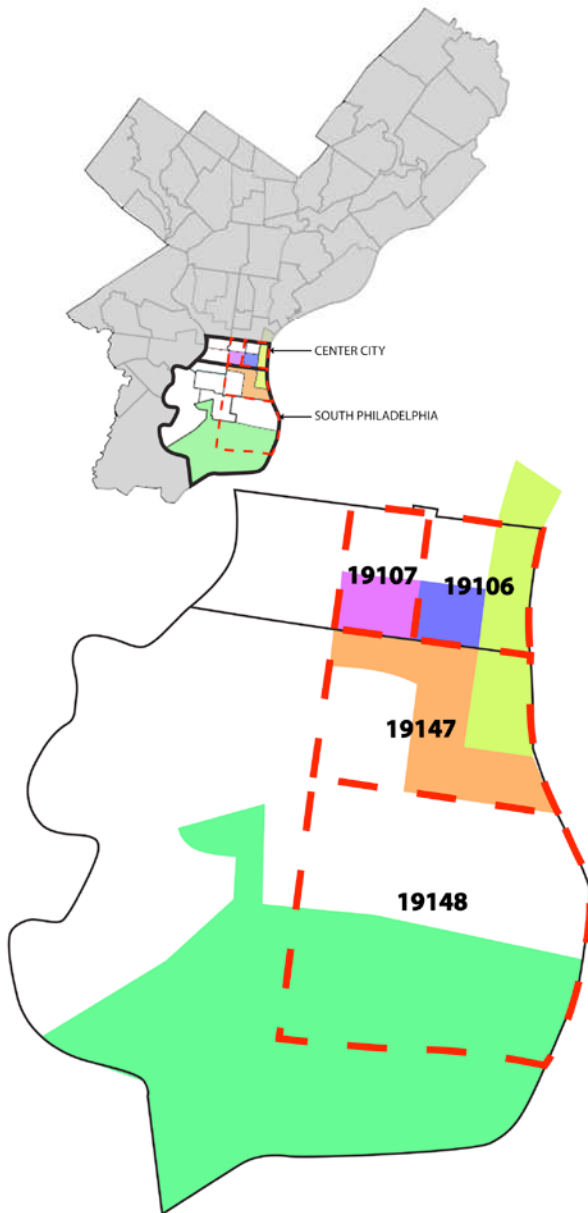
LOCATIONS OF ELEMENTARY and HIGH SCHOOLS

- SITE LOCATION
- ELEMENTARY SCHOOLS
- HIGH SCHOOLS
- MAJOR HIGHWAY
- RIVER



PHILADELPHIA DEMOGRAPHICS

INFORMATION ON CENTER CITY, SOUTH PHILADELPHIA, and FDR PARK



19106: (includes **Society Hill** and **Central Delaware Riverfront** Neighborhoods)

ECONOMIC INFORMATION:

Median Income: \$72,327
 Median Sale Price (Single Family Homes): \$715,500

DEMOGRAPHICS:

Population: 8,359
 % of Whites: 88%
 % of Blacks: 6%
 % of Hispanics: 3%
 % of Asians: 4%
 % of Other Race: 0%

19107: (includes **Washington Square West** Neighborhood)

ECONOMIC INFORMATION:

Median Income: \$30,242 per year
 Median Sale Price (Single Family Homes): \$248,000

DEMOGRAPHICS:

Population: 12,453 people
 % of Whites: 57%
 % of Blacks: 11%
 % of Hispanics: 4%
 % of Asians: 27%
 % of Other Race: 5%

19147: (Includes **Queen Village** and **Central Delaware Riverfront** Neighborhoods)

ECONOMIC INFORMATION:

Median Income: \$43,156
 Median Sale Price (Single Family Homes): \$368,910

DEMOGRAPHICS:

Population: 32,291 people
 % of Whites: 64%
 % of Blacks: 16%
 % of Hispanics: 6%
 % of Asians: 15%
 % of Other Race: 6%

19148: (Includes **Packer Park - Girard Estates** Neighborhood)

ECONOMIC INFORMATION:

Median Income: \$31,888
 Median Sale Price (Single Family Homes): \$161,100

DEMOGRAPHICS:

Population: 47,420 people
 % of Whites: 66%
 % of Blacks: 13%
 % of Hispanics: 6%
 % of Asians: 14%
 % of Other Race: 6%

FRANKLIN D. ROOSEVELT PARK

HISTORY: Built in 1914 by the Olmstead Brothers and was originally known as Leage Usland Park. The park was originally 300 acres of marsh that was filled and regraded.

ACTIVITIES: Golf, Tennis, Rugby, Baseball, Softball, Skate Park, Frisbee, Picnicing, + Fishing



SITE A
8th STREET and SOUTH STREET



SITE B
HEADHOUSE SQUARE



SITE C
EXISTING: WACHOVIA SPECTRUM



PROGRAM ANALYSIS

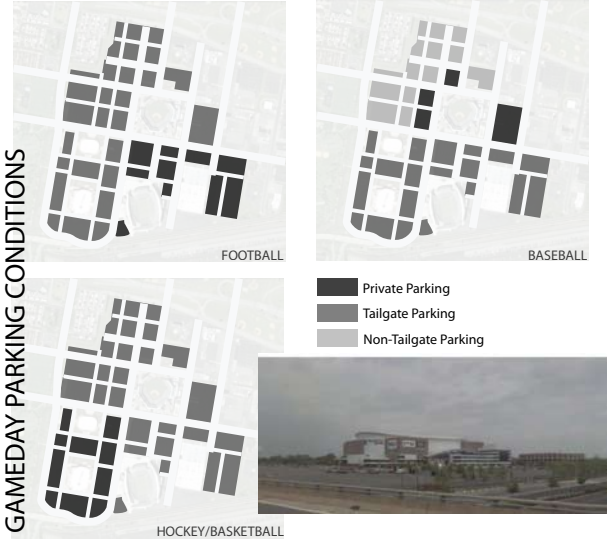
ACTIVITY CENTER FOR PERFORMING ARTS

EXISTING SITE CONDITIONS AND SURROUNDING P.O.I.s



- Hardscape (Parking)
- Public Greenspace
- Private Greenspace
- Parking Entrance/Exit
- Local Schools

GAMEDAY PARKING CONDITIONS



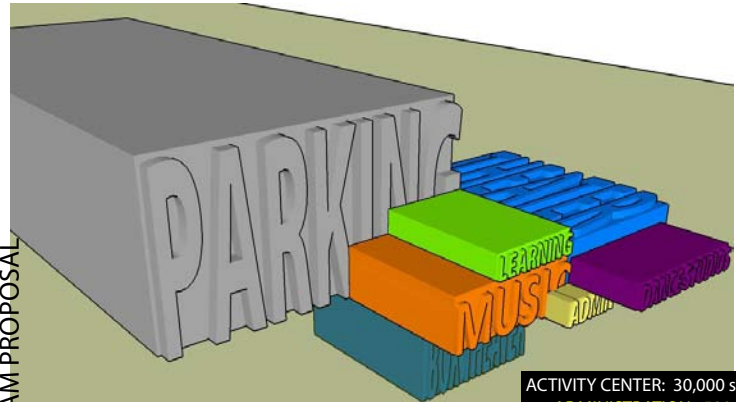
Current Proposed Project

Program:

- 300,000 sf total
- 68,000 retail
- 50,000 offices
- 450 residential units
- 200 room hotel
- 65,000 sf cinema
- 68,000 sf club/entertainment space

- * uses only surface parking
- required to maintain at least 4500 parking spaces by code
- * height limit is 150'
- * will "animate" Pattison Avenue and elevate the "sea of parking"

THESIS PROGRAM PROPOSAL



Site plan to include:
 Outdoor Amphitheater
 Sound Installation
 Sculptures
 Landscape Hardscape

- ACTIVITY CENTER: 30,000 sf
- ADMINISTRATION: 500 sf
- CLASSROOMS (4): 1350 sf
- LARGE MEETING: 1500 sf
- LIBRARY: 600 sf
- MUSIC SUITE: 5660 sf
- DANCE STUDIOS (3): 3040 sf
- AUDITORIUM: 10,000 sf
- BOX THEATER: 6,000 sf
- PARKING STRUCTURE: 350,000 sf

SOUTH PHILADELPHIA: STADIUM DISTRICT EXISTING SITE CONDITIONS



Primary Arteries Secondary Arteries Tertiary Arteries



Primary Arteries Secondary Arteries Tertiary Arteries



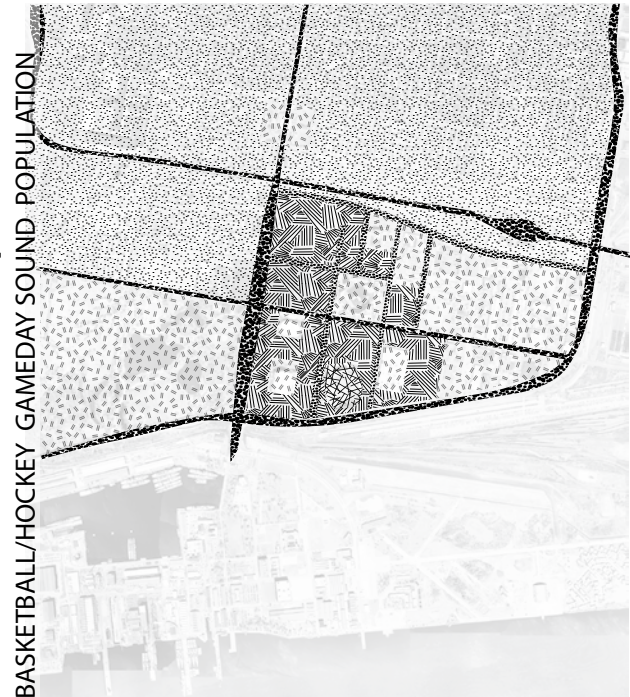
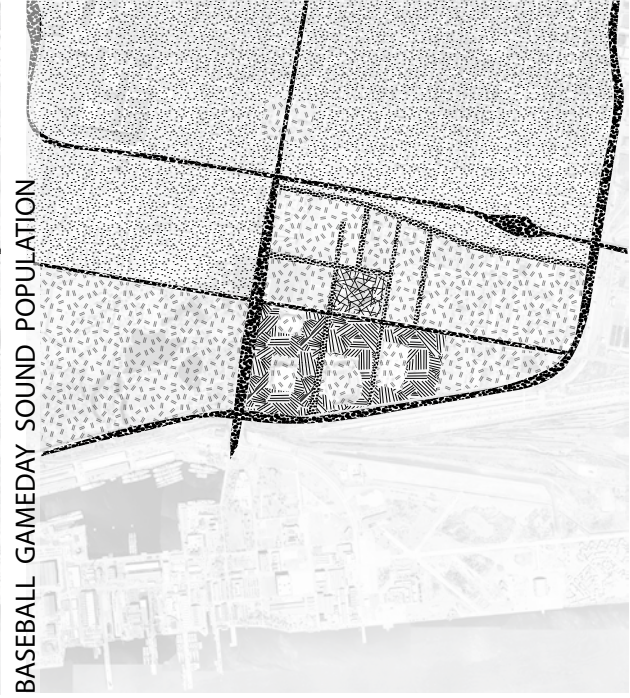
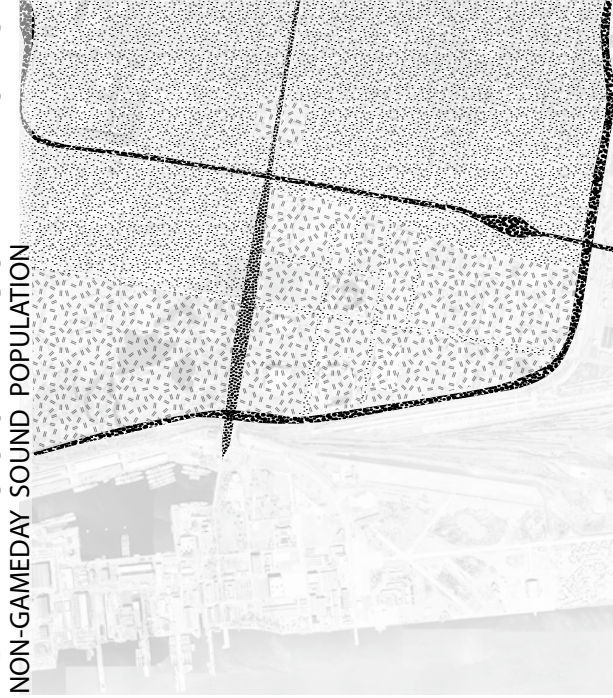
High Traffic Roads Moderate Traffic Roads Low Traffic Roads



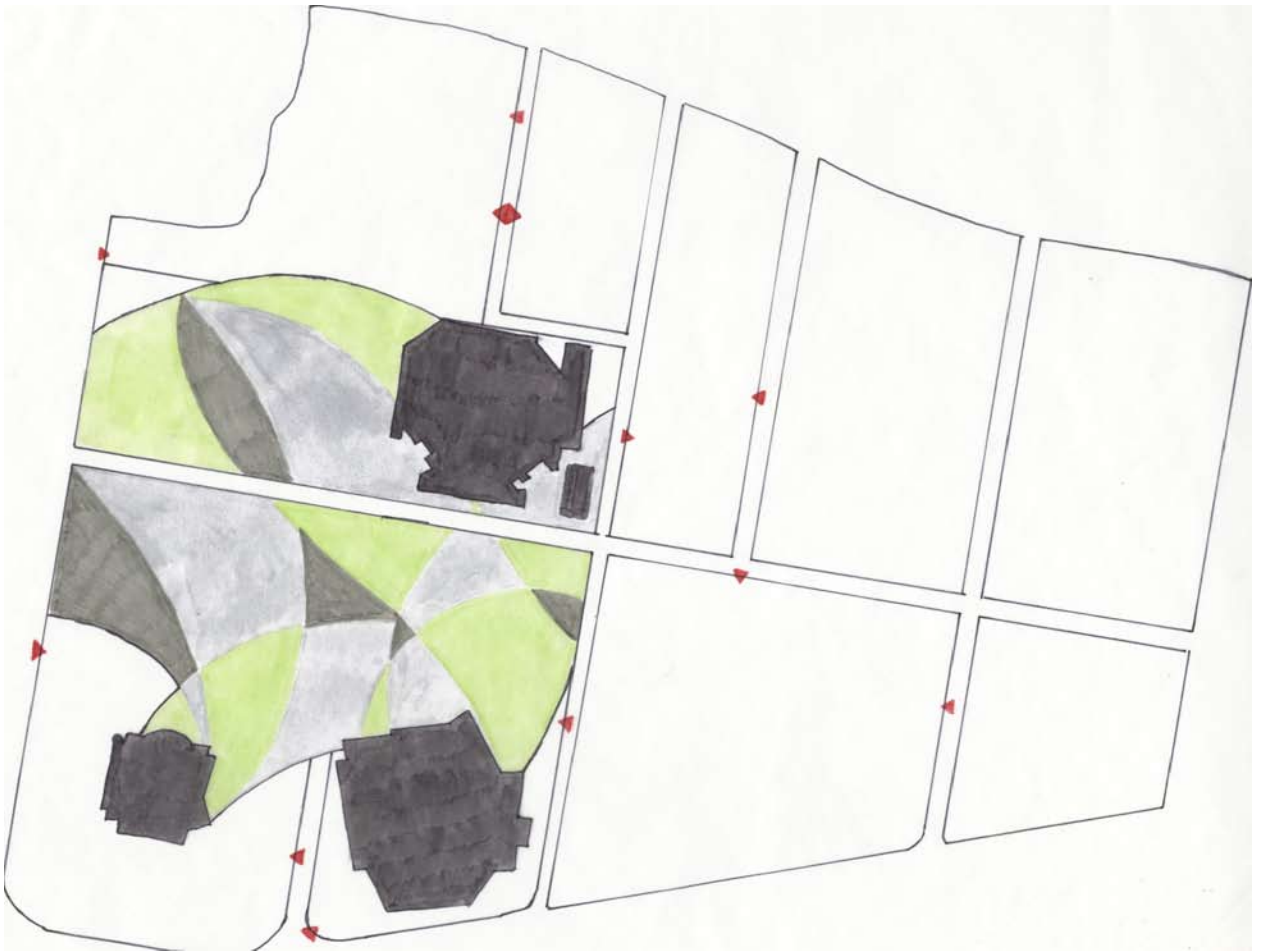
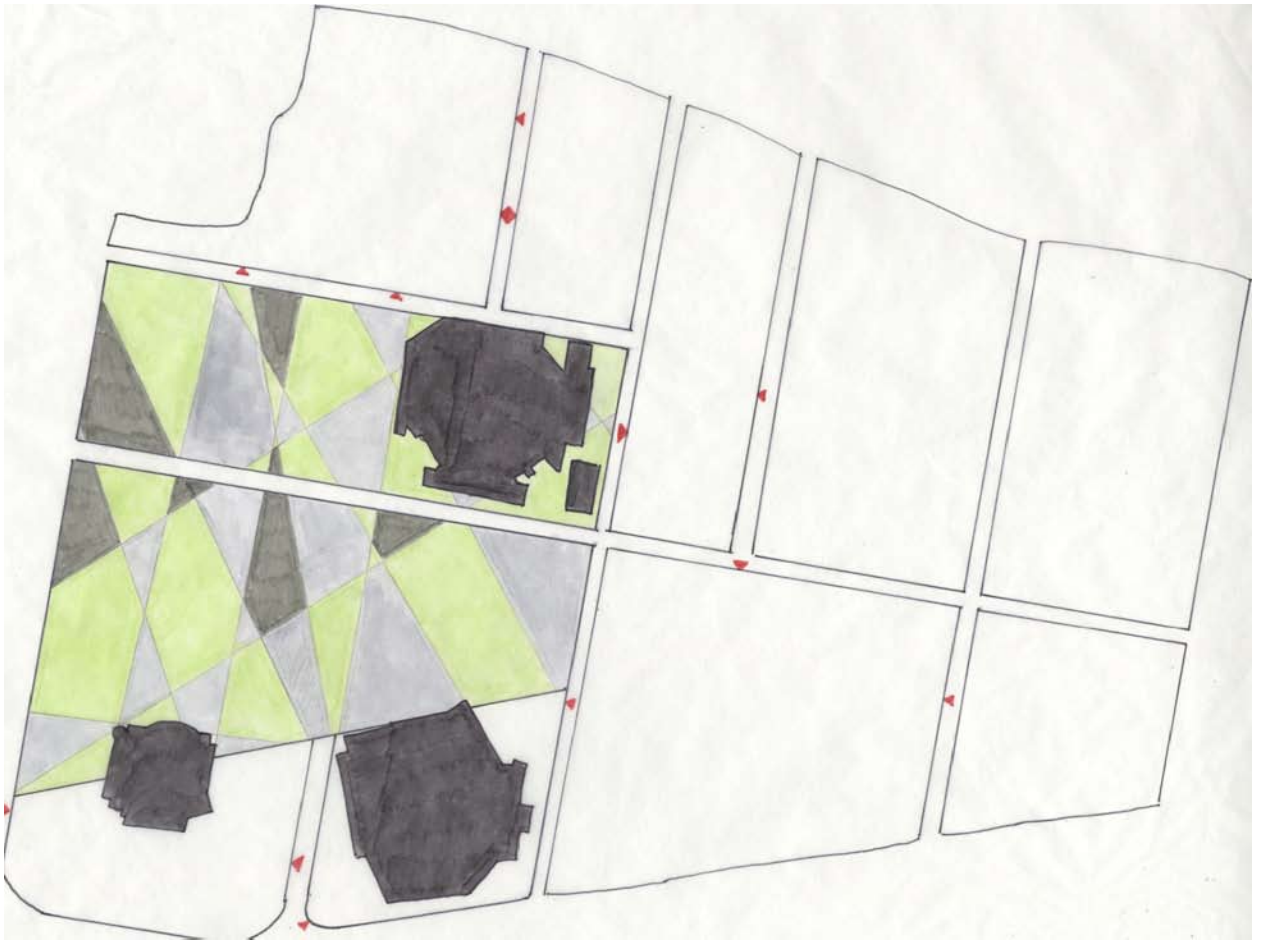
High Traffic Roads Moderate Traffic Roads Low Traffic Roads
● Parking Entry/Exit Points

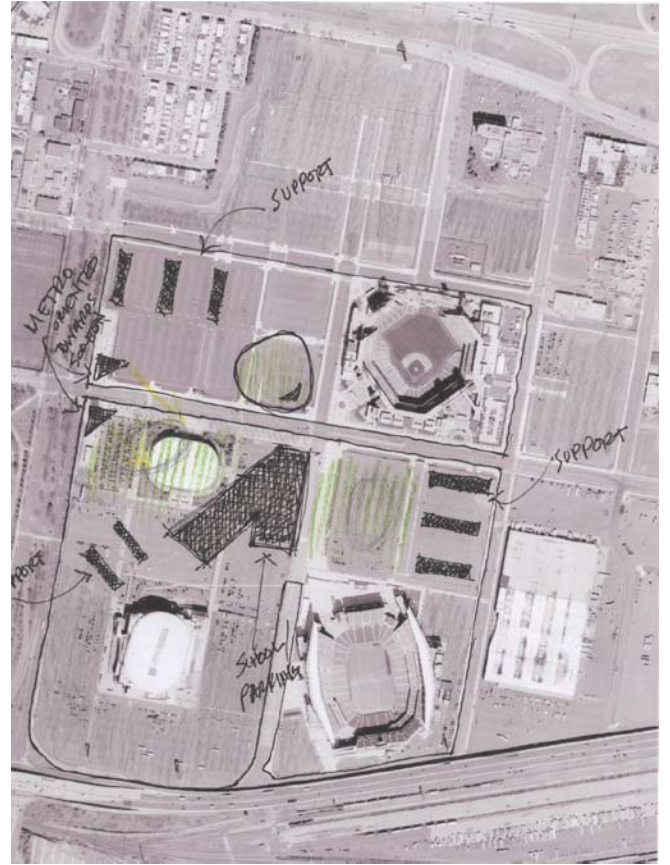
SOUND CONDITIONS

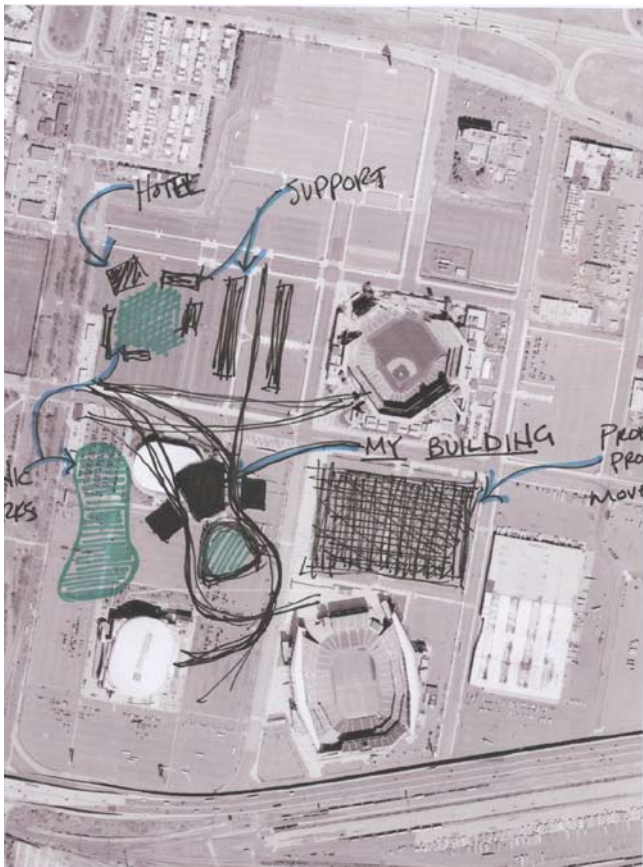
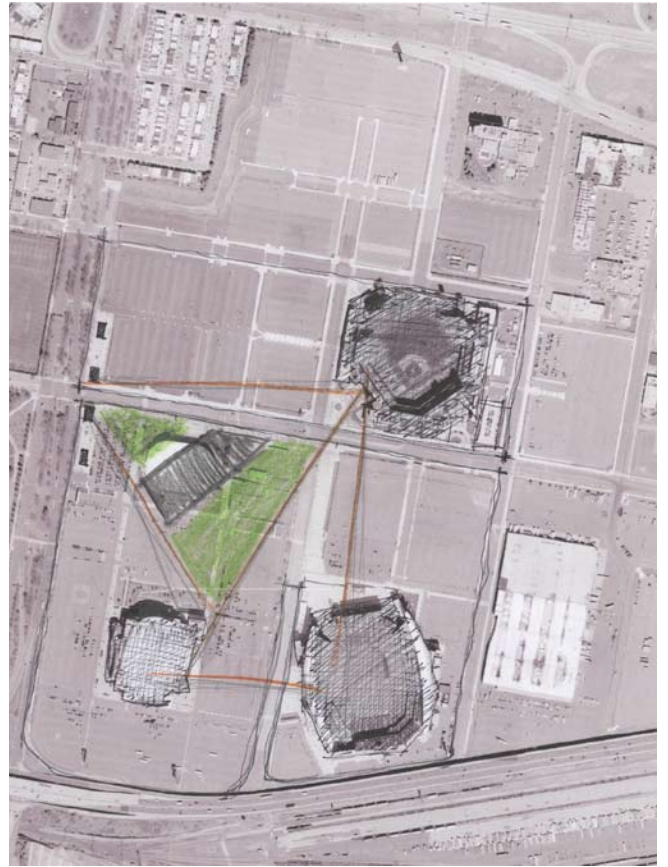
SOUTH PHILADELPHIA: STADIUM DISTRICT



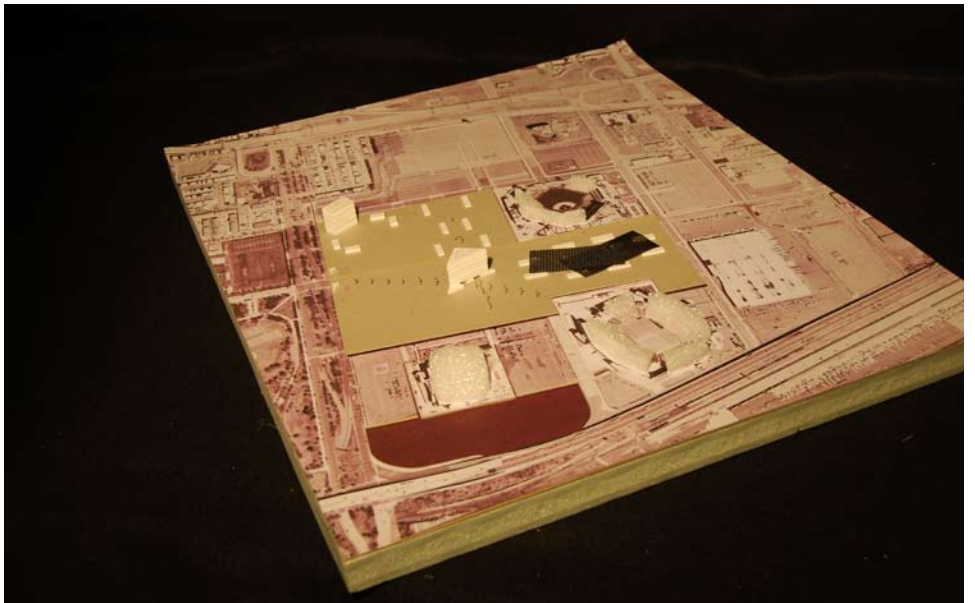
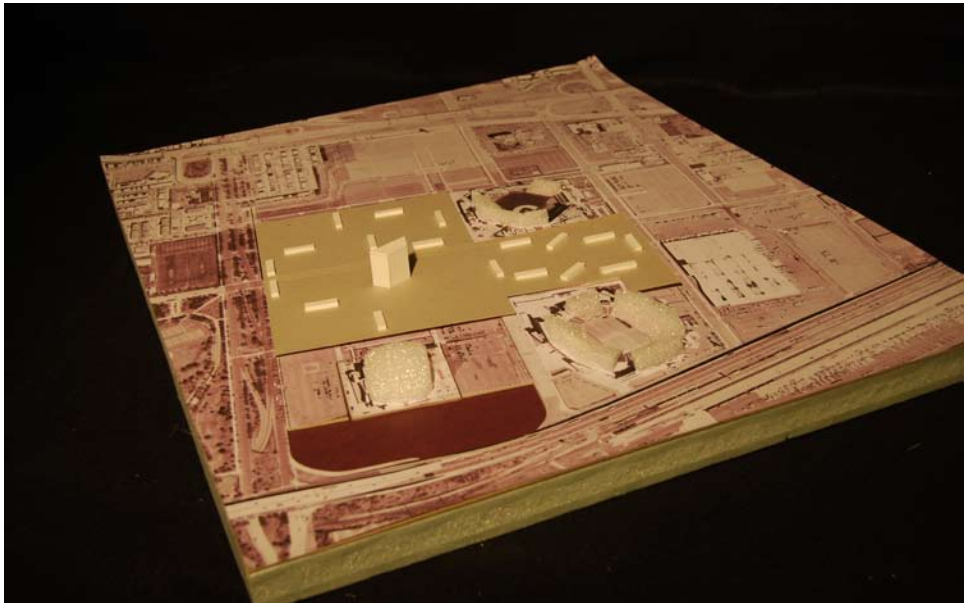
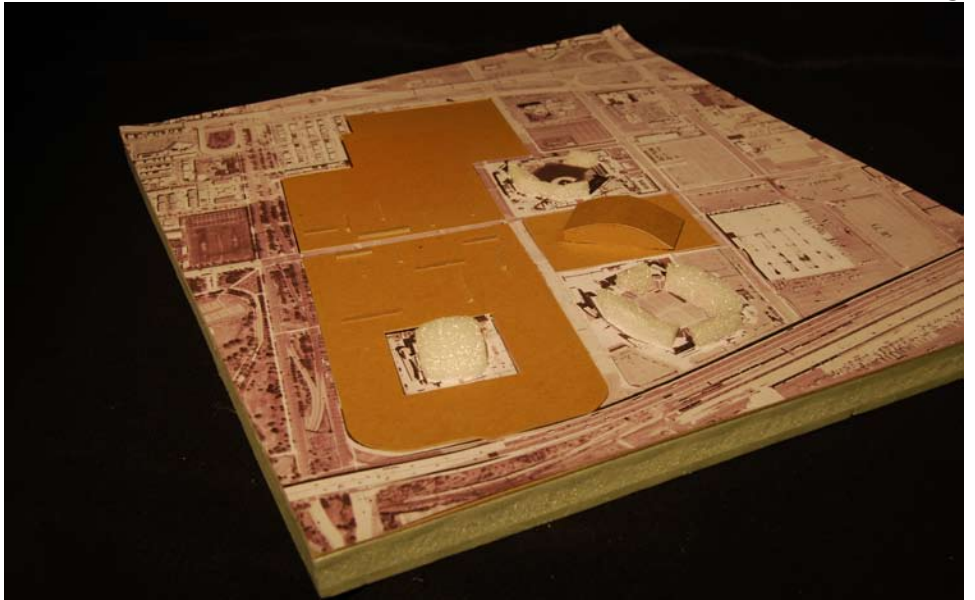














THESIS DESIGN DOCUMENTATION
FINAL DESIGN



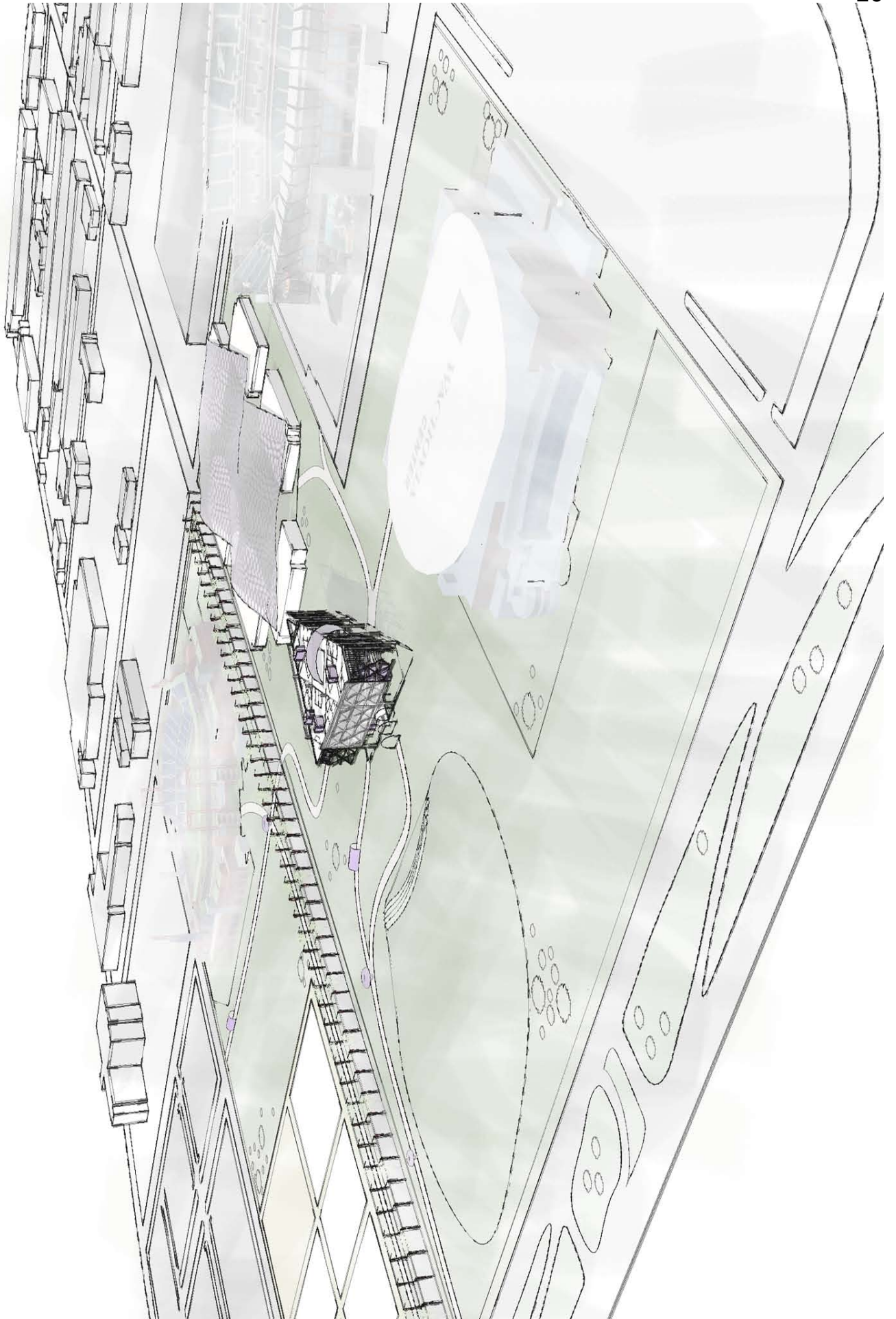
PHILADELPHIA SPORTS COMPLEX
SITE PLAN PROPOSAL

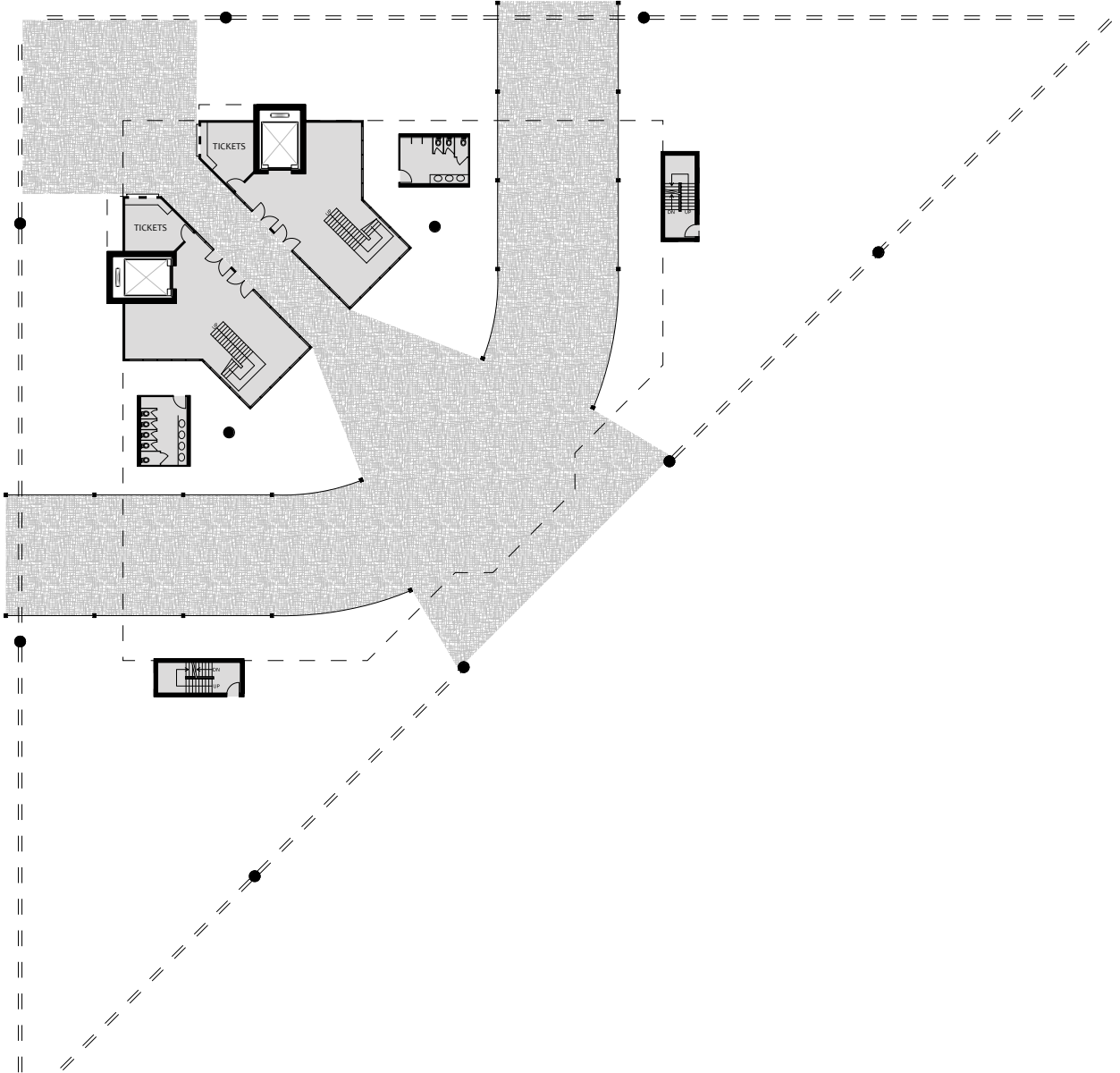
SCALE: 1"=200'



©2009



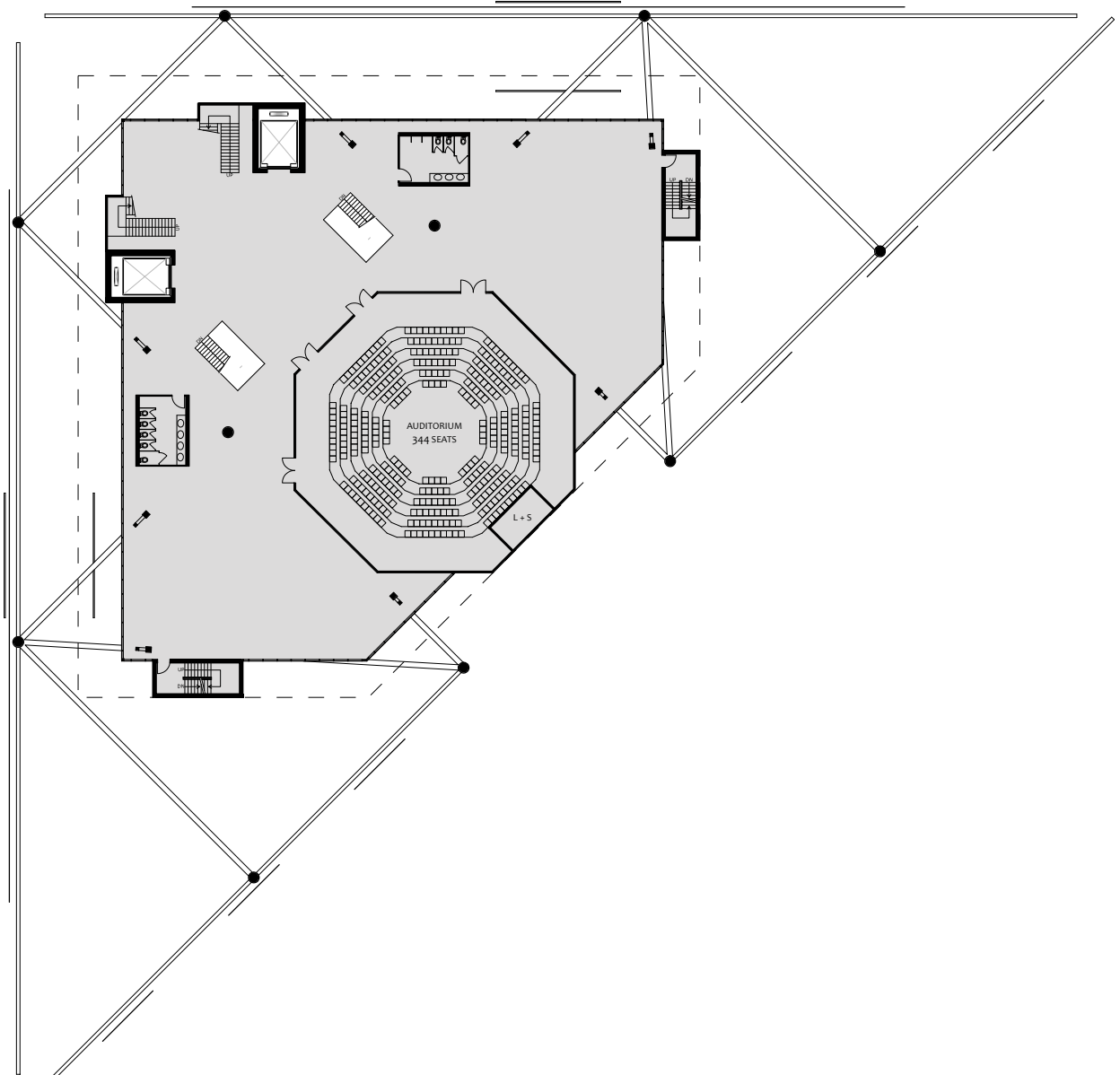




00 LOBBY LEVEL

SCALE: 1/16"=1'

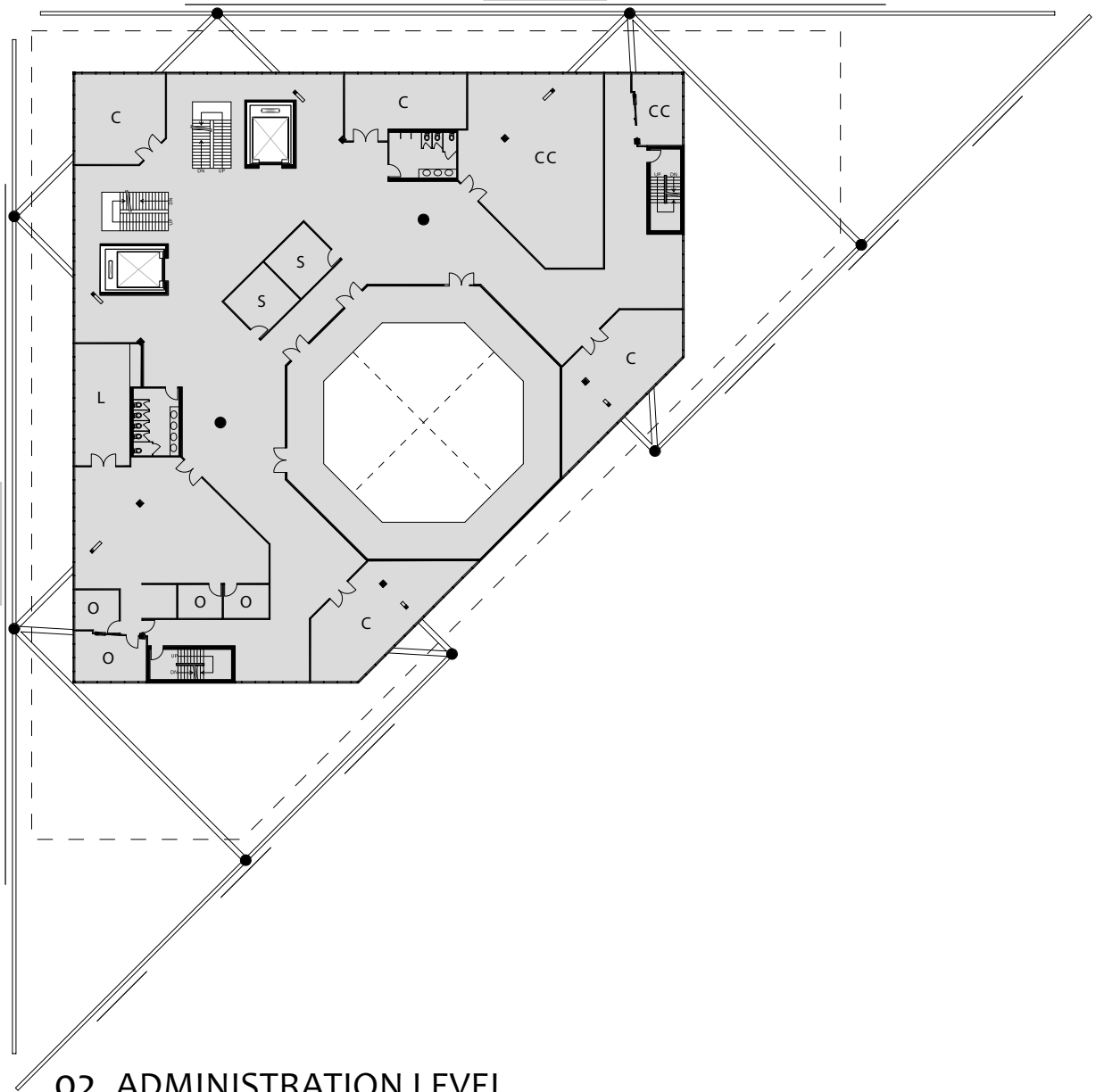




01_AUDITORIUM LEVEL

SCALE: 1/16"=1'





02_ ADMINISTRATION LEVEL

SCALE: 1/16" = 1'

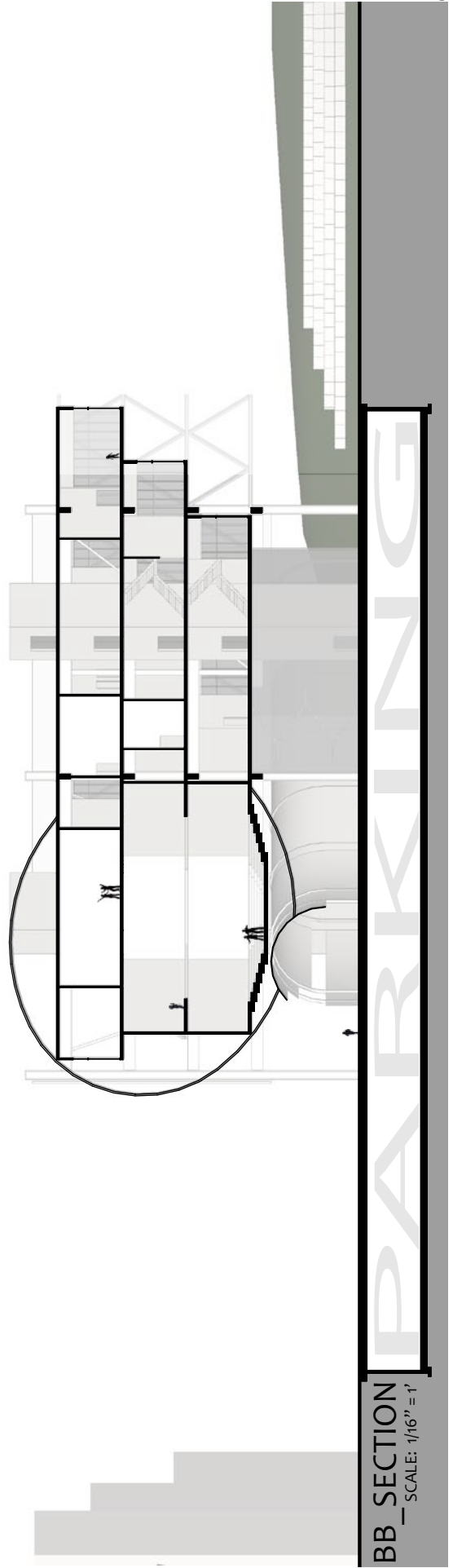
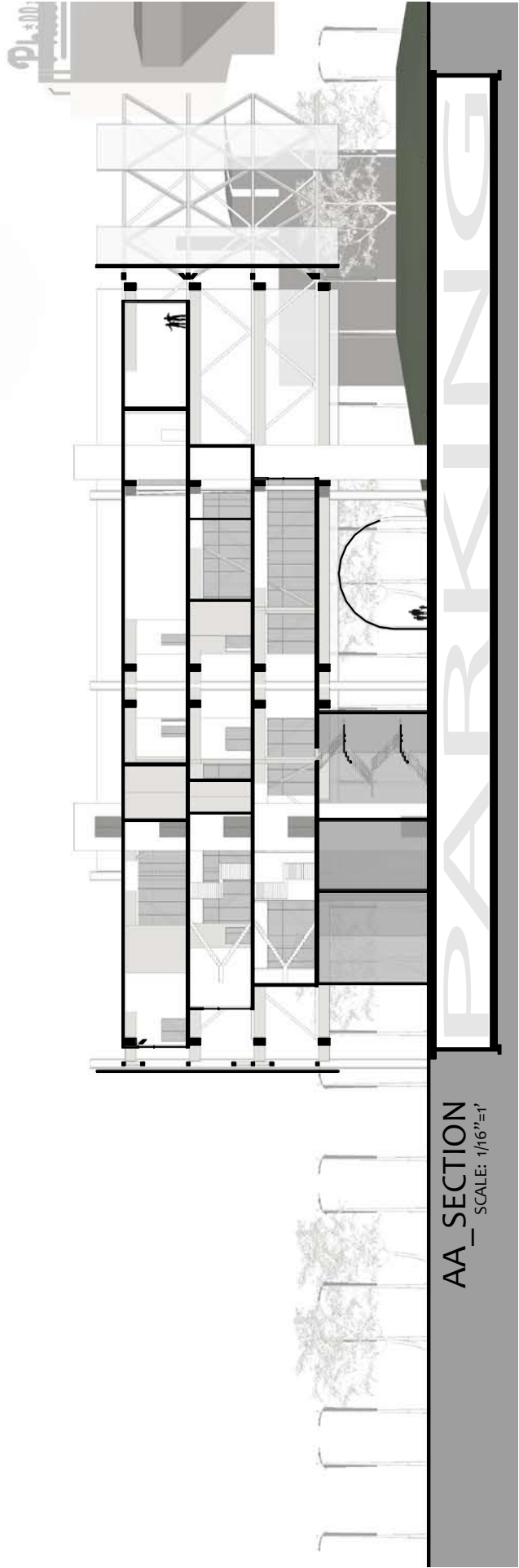


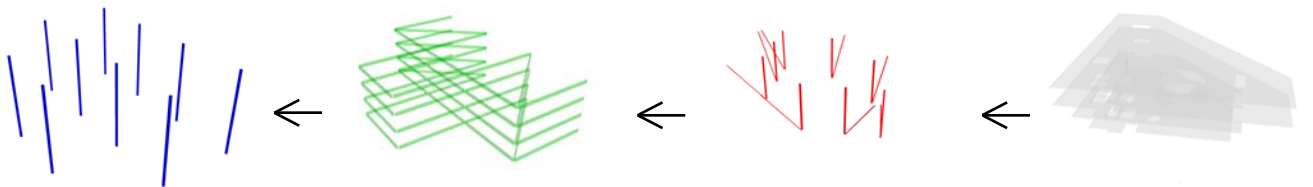
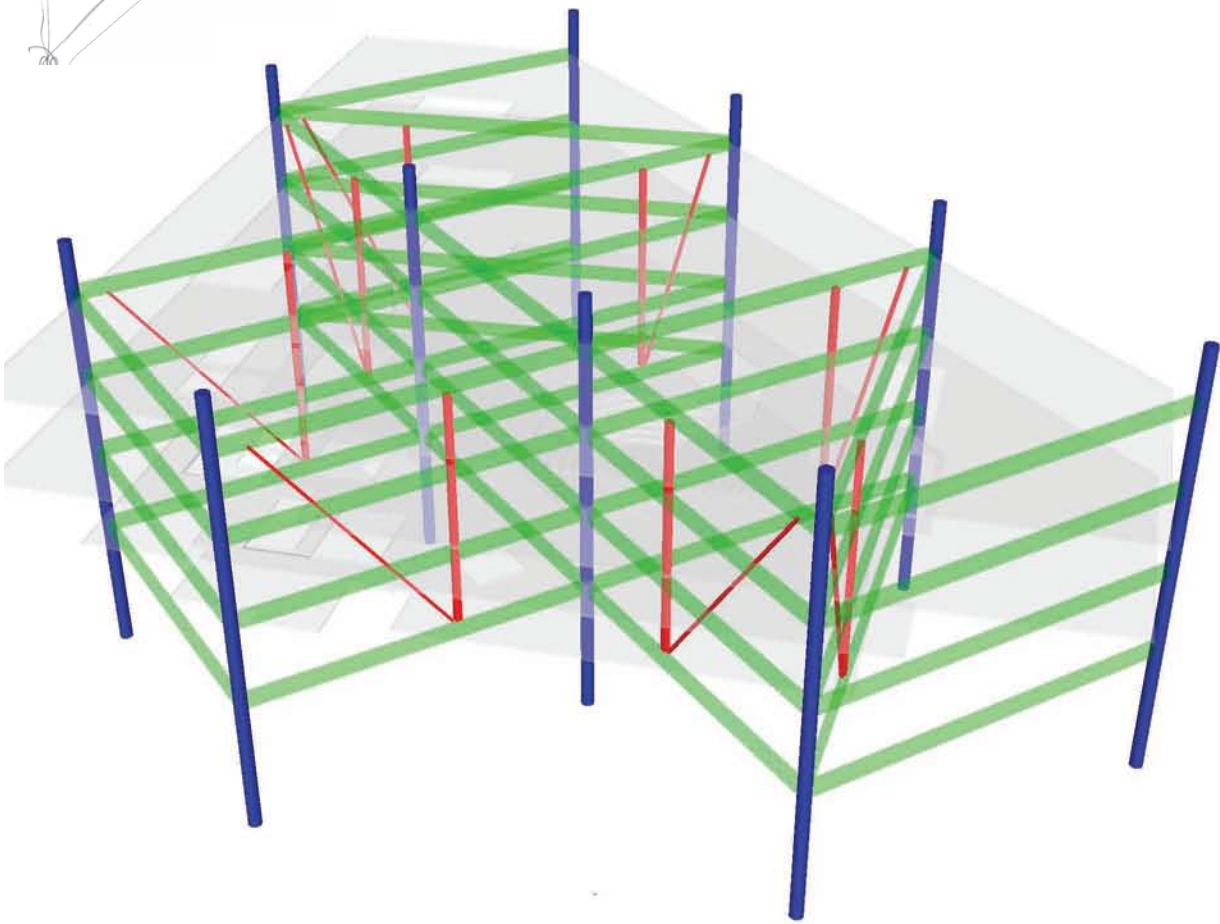
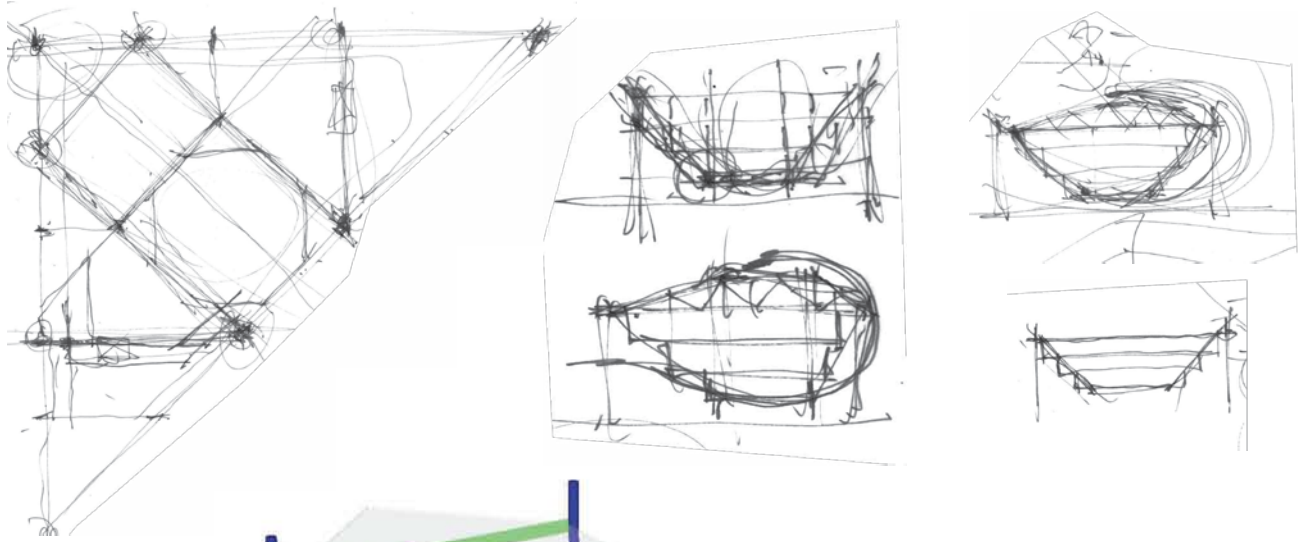


03_REHEARSAL LEVEL

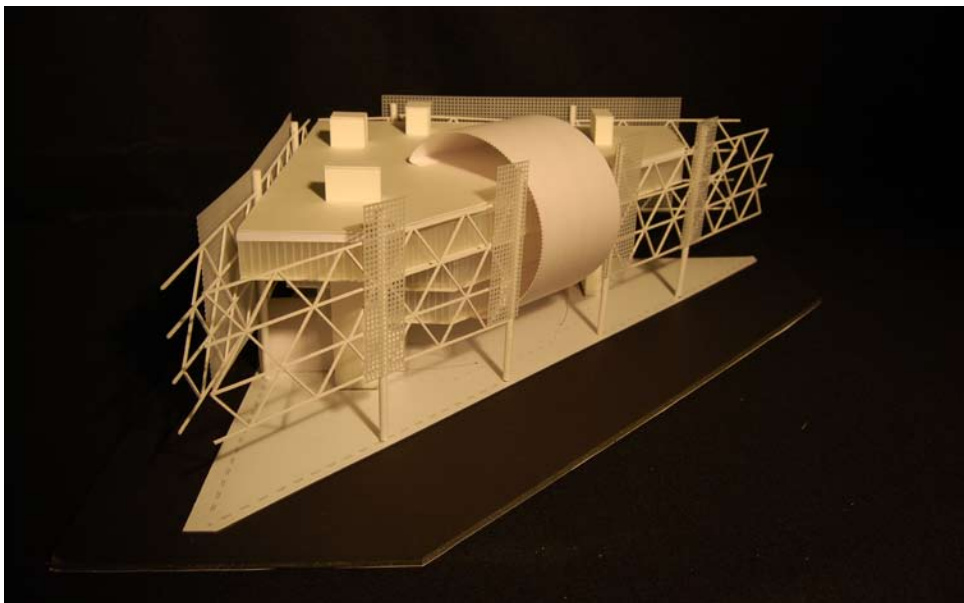
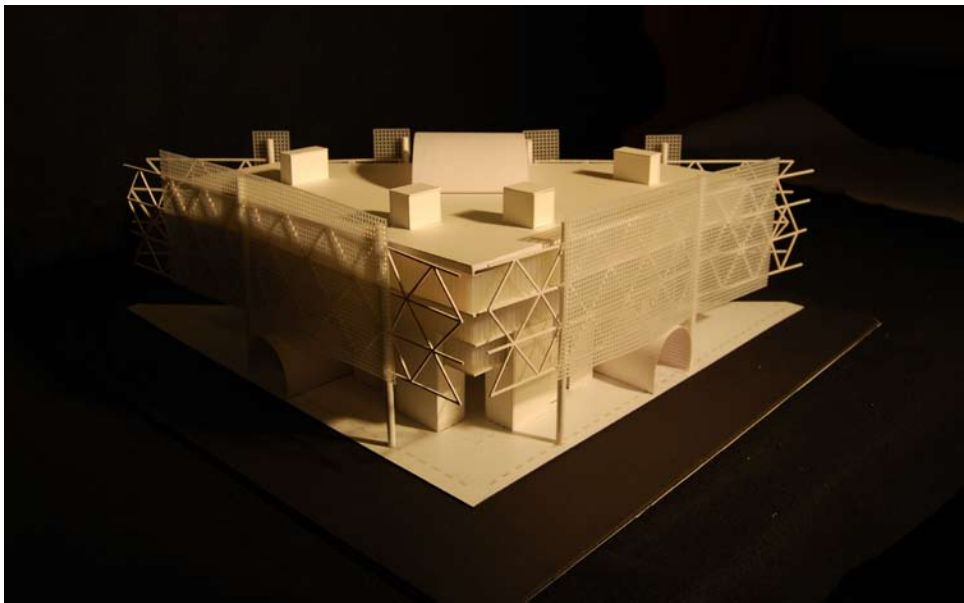
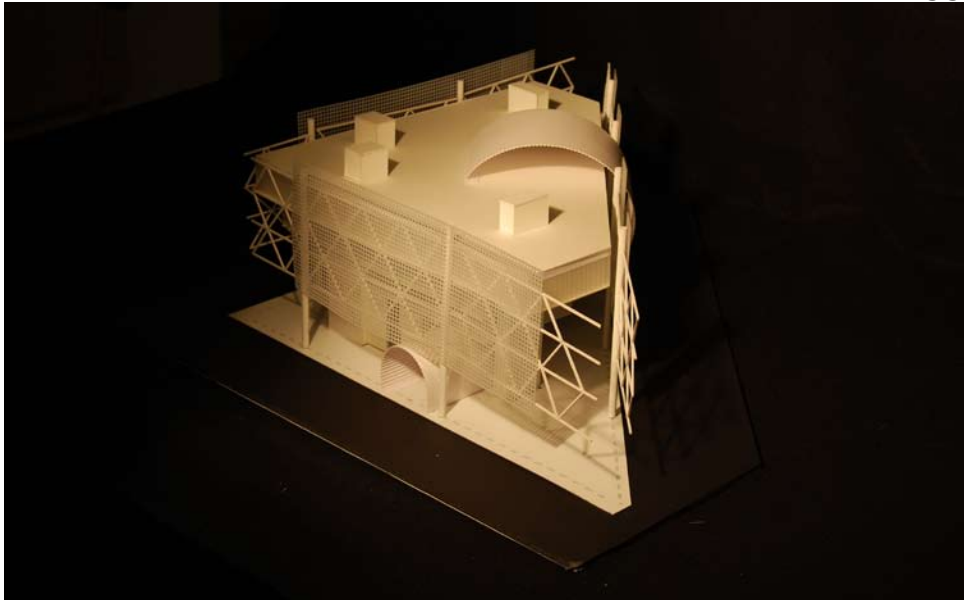
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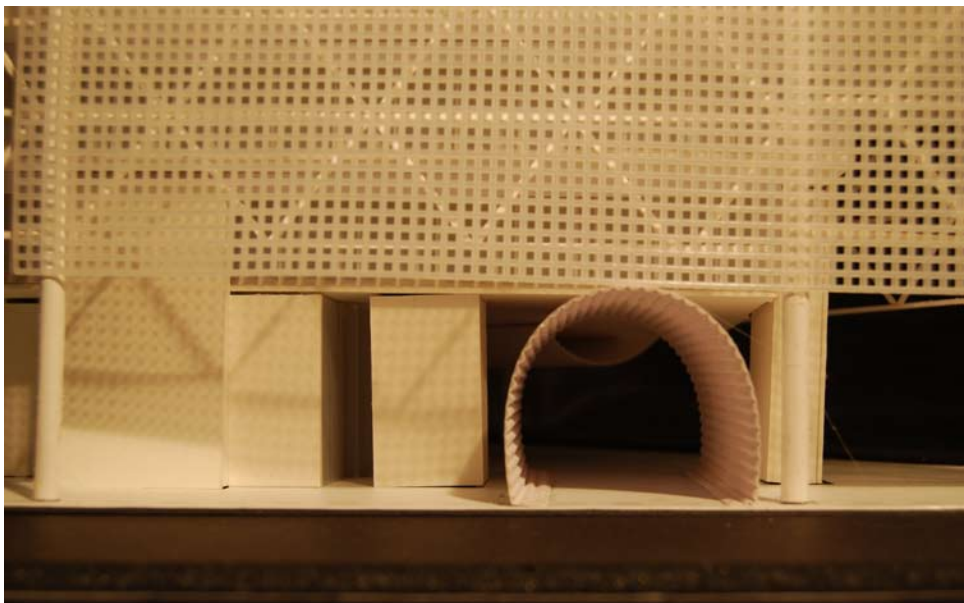
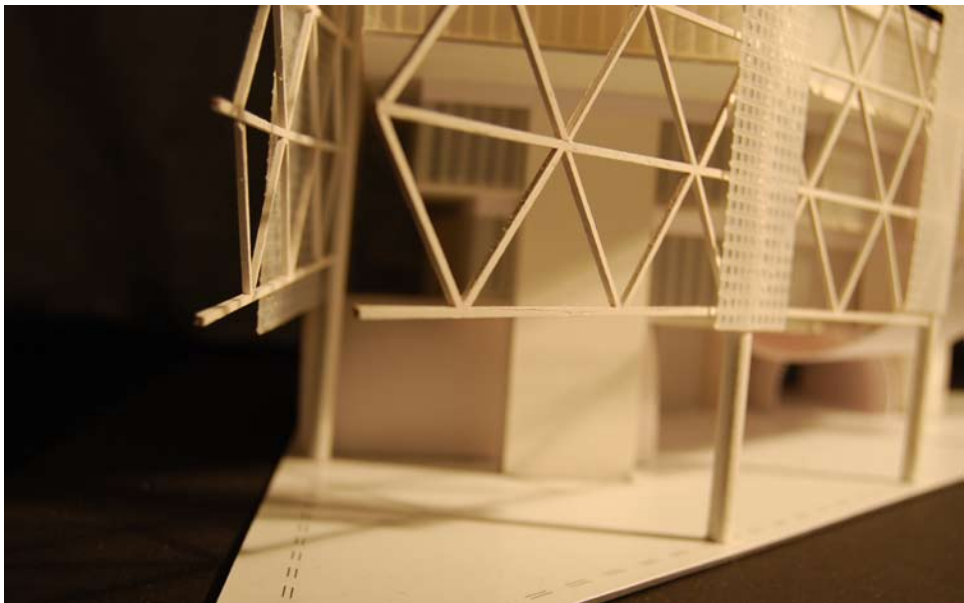
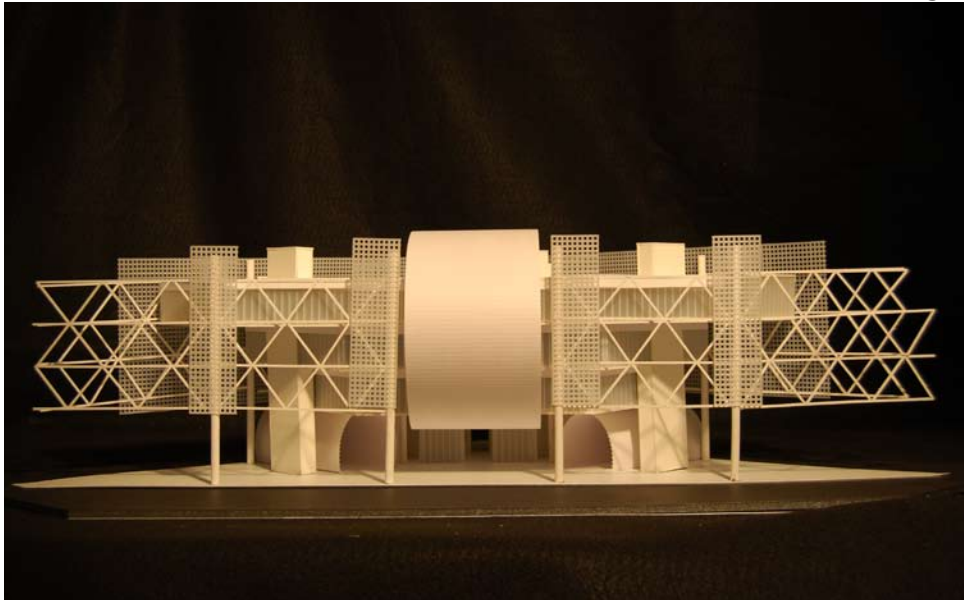


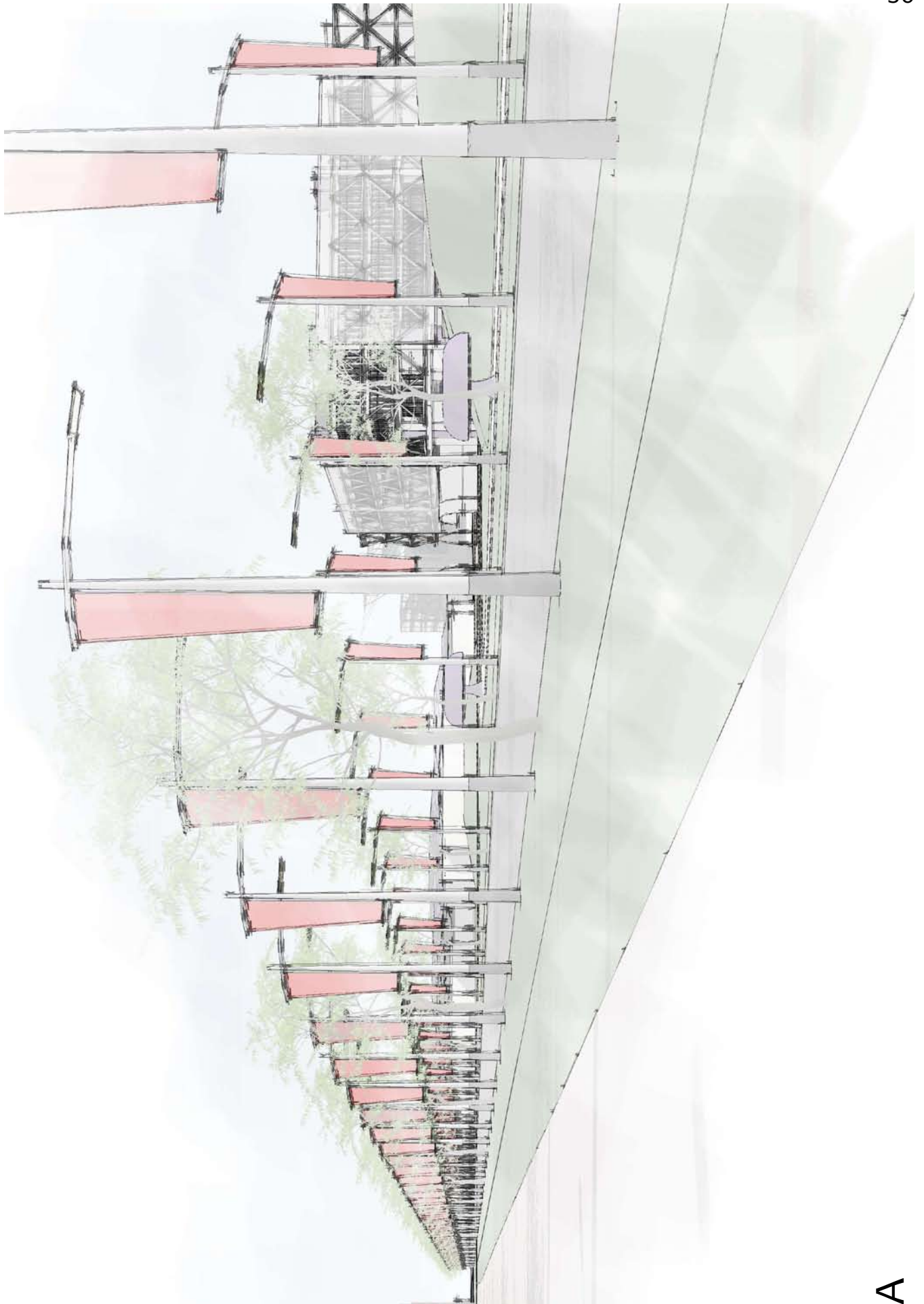


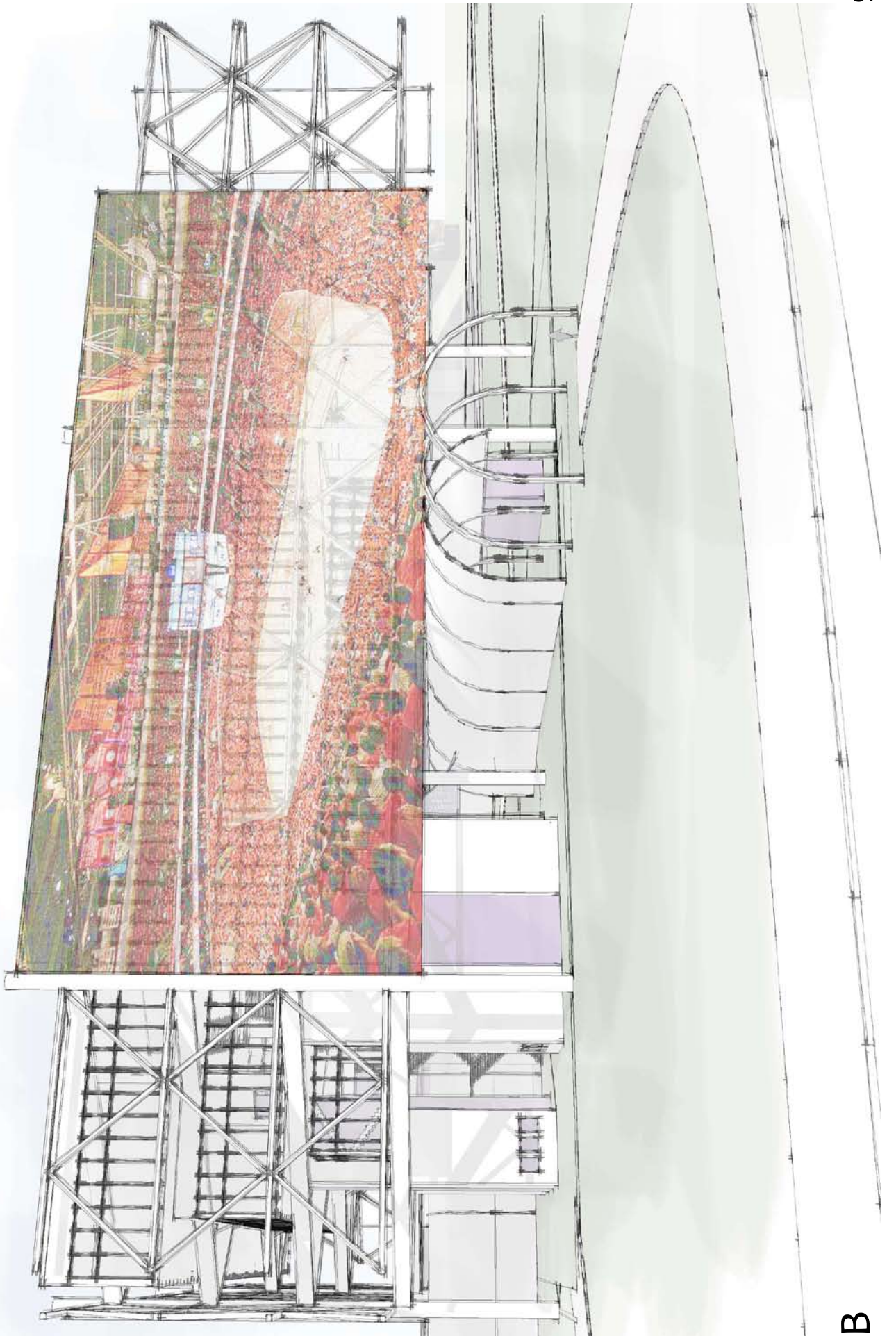


BUILDING STRUCTURE DIAGRAMS



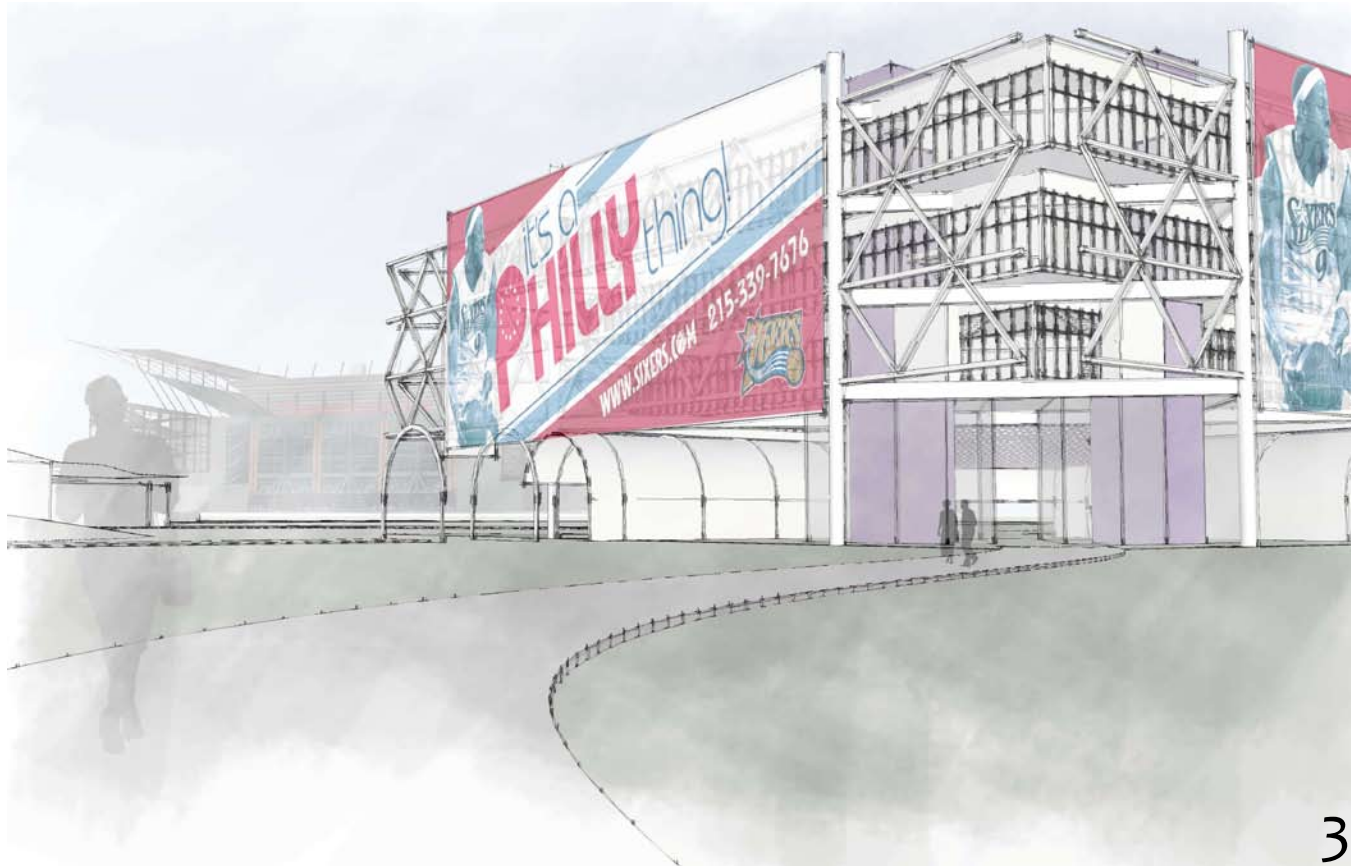








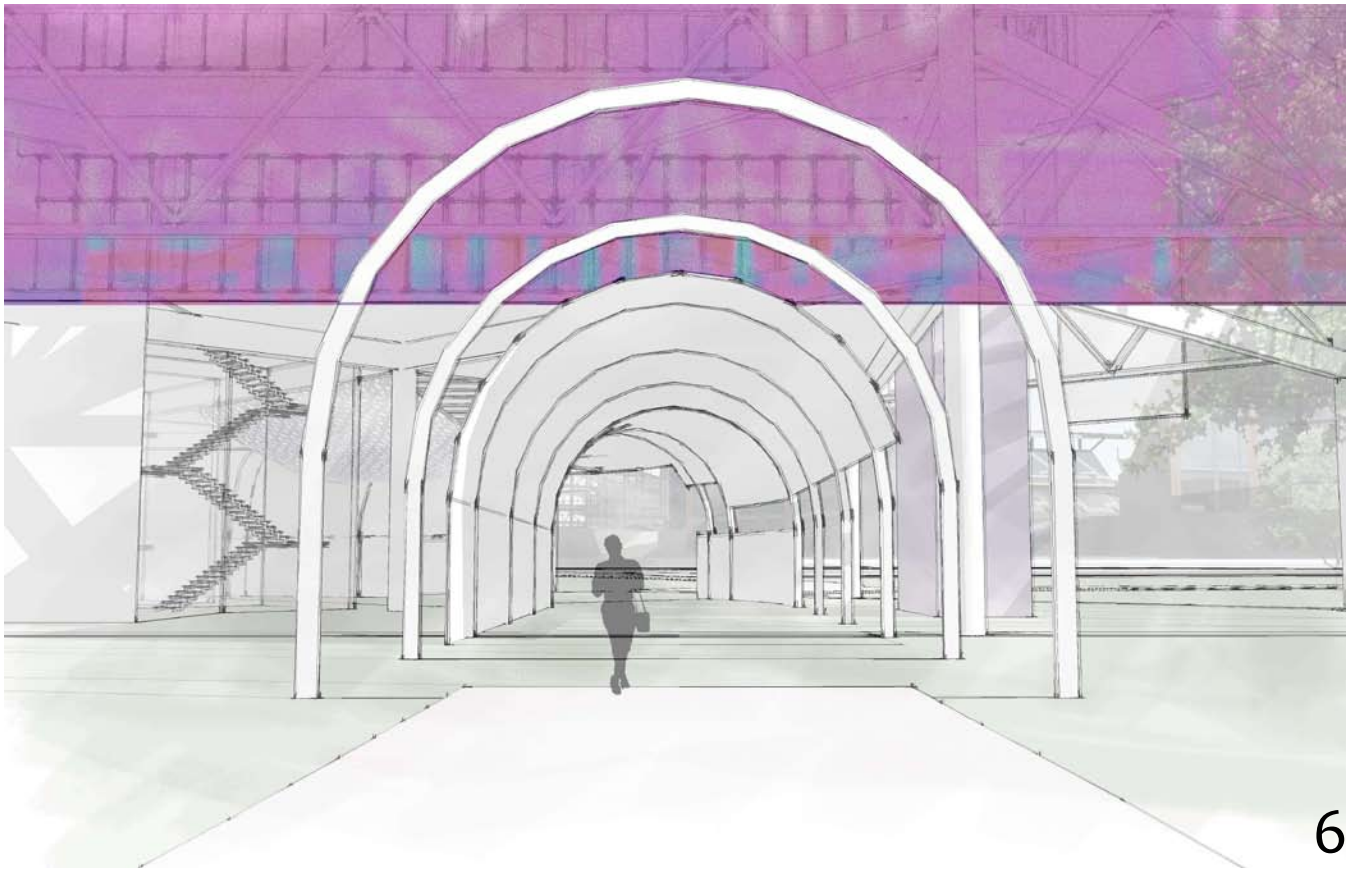
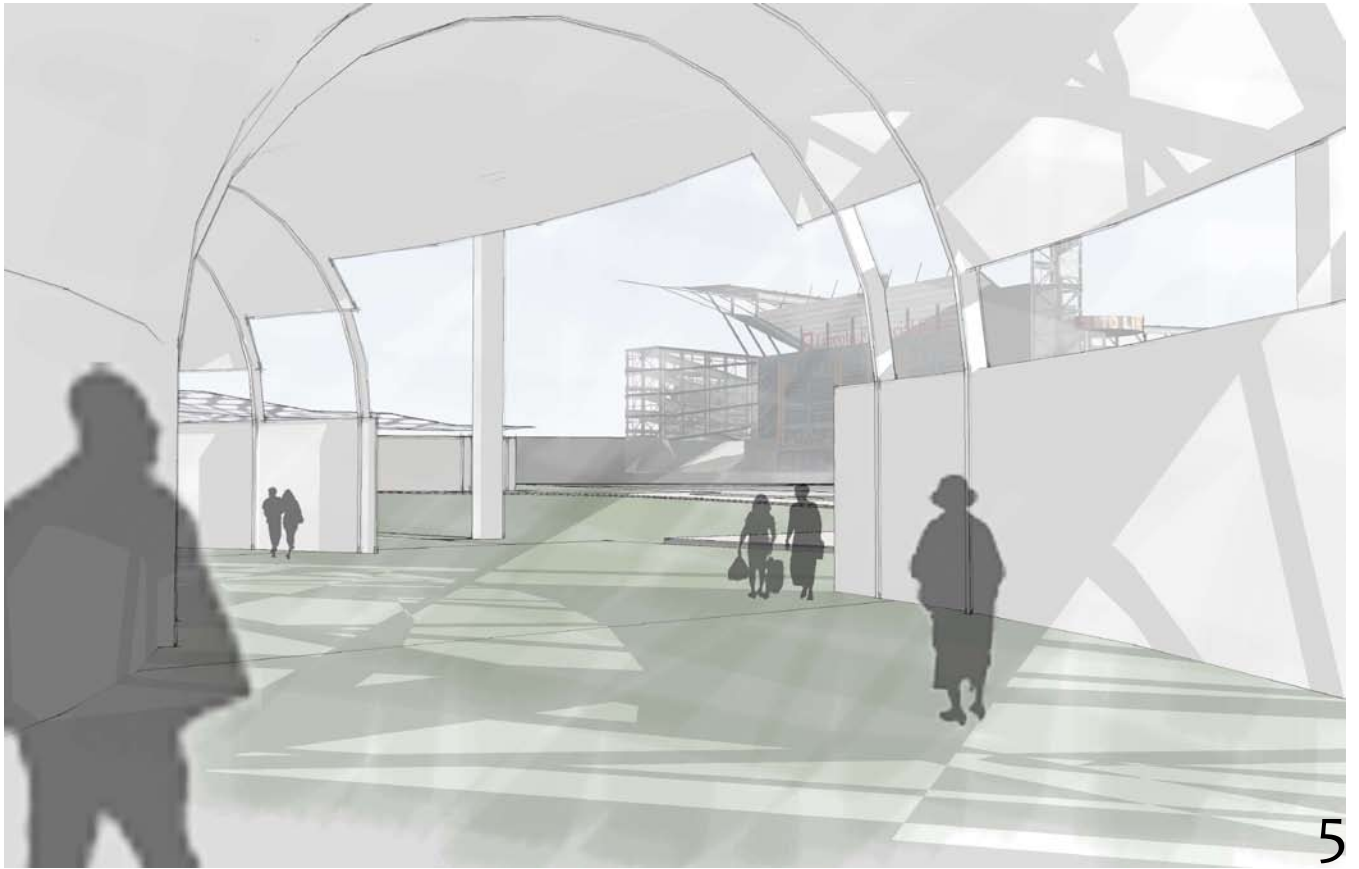


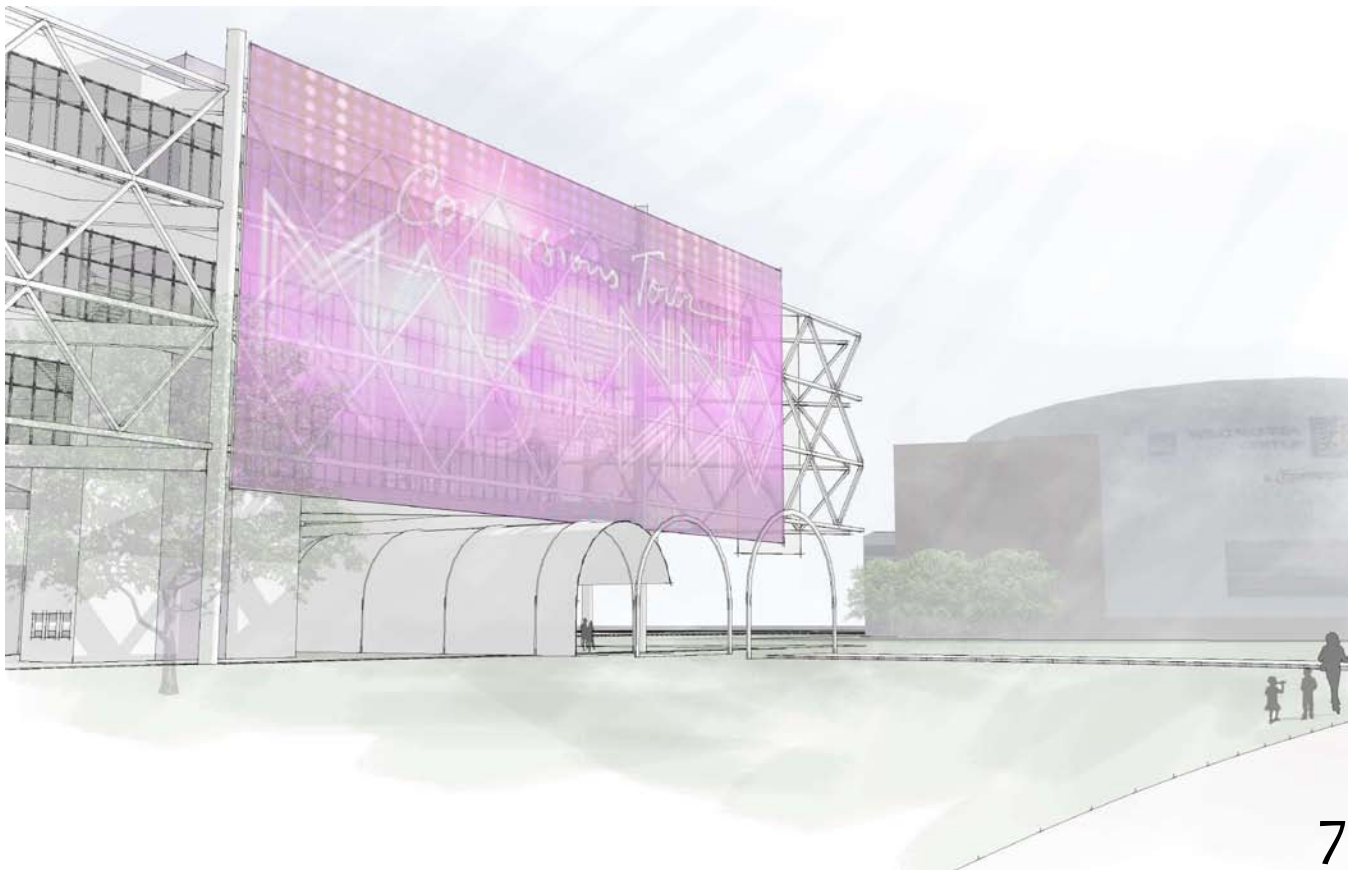


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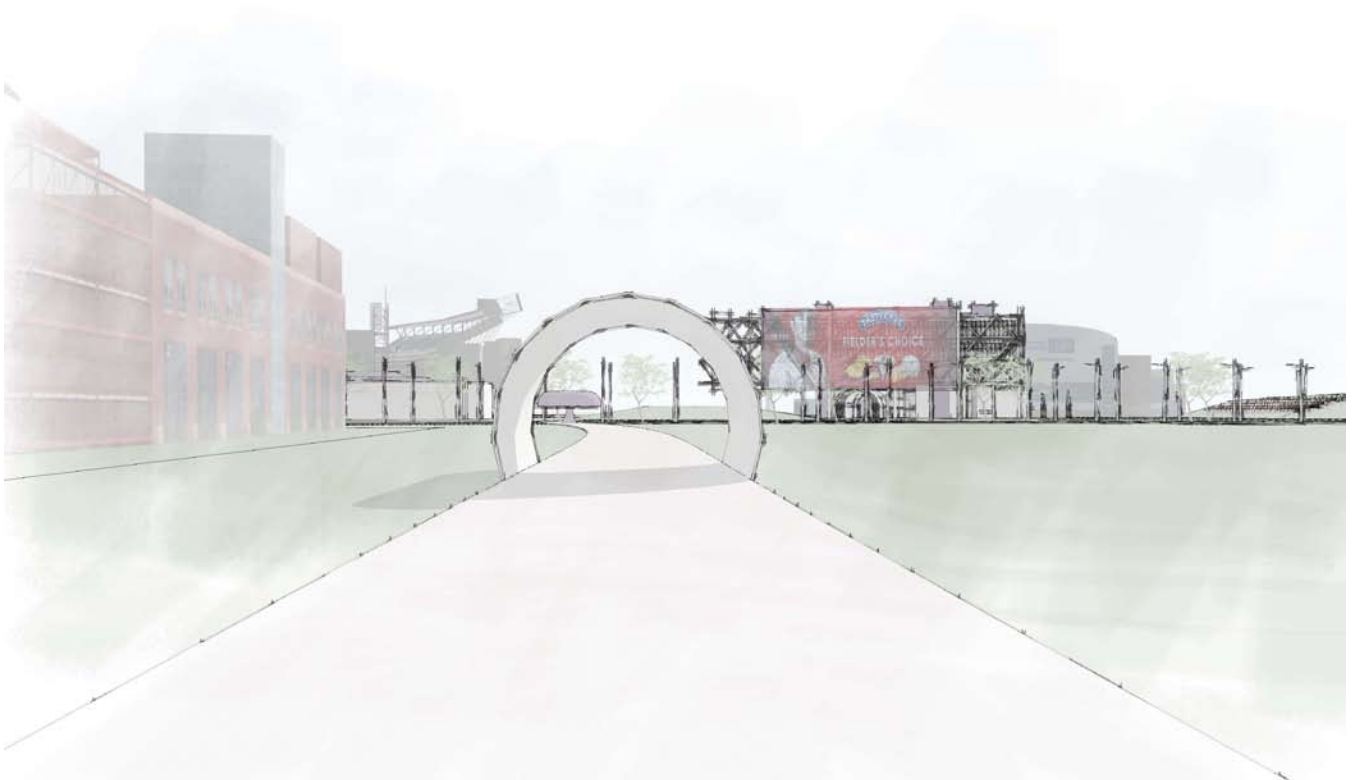


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THESIS DESIGN ADDENDUM

Defining the Center of Philadelphia's Sports District *Thesis Design Addendum*

"I think that the general idea as an architect is trying to add another layer of material within a space. ...I'm trying to find ways to make public spaces continuously refreshing."

- Christopher Janney

Throughout the design process, I was greatly influenced by the concepts of tap dancing and the ideas behind Christopher Janney's sonic architecture. The initial thesis question asked "how can architecture employ the use of sound as a foreground element in the design of a building to create more dynamic, more interesting, and more personal experiences?" Taking my design to Philadelphia harbored an exploration of ways to enrich the experience of a city that is already heavily influenced by history, cultural traditions, and the performing arts.

The first stages of the thesis design process lead me to explore three sites located in Philadelphia. Site A and Site B are along South Street, a Bohemian area that defines the southern edge of Center City. Site C is located in the Sports District of Southern Philadelphia and proved to be the most interesting and challenging site to deal with. Both Site A and Site B limited the program of the design to fit an appropriately sized building to match the existing cityscape. Site C was much more open to interpretation and was not limited by zoning requirements to fit a specific use.

Master Plan Design Approach

The Philadelphia's Sports District currently houses four sports venue facilities. Within the last 10 years, three new facilities have been designed and built to replace the older ones that had seemed to become inadequate for their appropriate uses. Veterans Stadium, which was the original home of the Philadelphia Phillies and Philadelphia Eagles, was replaced in 2004 by Citizen's Bank Park and Lincoln Financial Field (homes of the Phillies and Eagles respectively). The Spectrum, which served as the hockey and basketball arena, was replaced in 1995 by the Wachovia Center. The Spectrum is still standing today but will be torn down in the summer of 2010 and replaced by a new shopping area called Philly! Live that is

reminiscent of the Baltimore Harbor shopping district in Baltimore, Maryland.

As the thesis design began to evolve from the initial ideas explored in the thesis document, the thesis design question also began to change. The new question asks, "How can the awareness of sonic architecture enhance the built environment?" The proposal for my thesis design project looked reevaluate the current master plan of the Philadelphia Sports District by eliminating the excess surface parking that surrounds the sports facilities. By removing the surface parking that lines Patteson Avenue, a six-lane road that travels from east to west, I was able to reconsider how this main vehicular and pedestrian corridor could be reactivated and more inviting to the site visitors and daily users. The master plan relocates the design for Philly! Live to the eastern edge of the Sports District in the space between Citizen's Bank Park and Lincoln Financial Field. A centralized structure that would help visually connect the three sports facilities would then replace the Spectrum.

Southern Philadelphia is a dense, residential area of the city and I felt that an appropriate building program for this site would be a performing arts center for teens that could be used for community purposes as well as instructional classes for teens interested in the performing arts. Also, by replacing the Spectrum with a performing arts facility, the activities of the building would help bring the rich performing arts culture and history that exists in Center City to the southern edge of the city proper.

The final master plan of the thesis design embraced the influence that Christopher Janney has had on my ideas. Circulation paths are used to move people from the subway station and the parking lots through the site and underneath the performing arts center to whichever sports venue the visitor is traveling. Along these paths, sonic structures are dispersed to help direct people and act as signifiers for people coming and going. Transparent LED panels on the exterior of the performing arts center act as promotional billboards and entertainment screens to broadcast performances, and the sports events.

Building Design Approach

The form of the Performing Arts Center for Teens (nicknamed PACT) was derived from the anticipated movement of people through the site. The triangular shape helped ensure that from whatever direction people were traveling, they would see the visual element of the LED screens. The most challenging issues that arose during the design process were determining the placement of the building program into such an odd building geometry.

To work with the unique shape of the building, the program was broken into groups that were defined by the level of privacy necessary for each room's function. The most public spaces are located closest to the ground level and the most private spaces are located on the highest floor. Also, the floor plates get larger as you move up the building because there are more spaces that need to have controlled access.

The triangle shape of the building was the main influence to have a theater-in-the-round as the main auditorium space. The two-story volume of this space allowed for flexibility within the auditorium.

The building's structure is made up of a series of structural steel columns that exist along the perimeter for the building form. The floors are suspended from tensile cables that are attached to a system of beams connected to the exterior columns. The tensile cables hang from the highest set of beams and form a cradle-like structure that holds each floor in place. This approach was taken to make sure that the building touches as lightly on the ground as possible.

Another key element of the building design is the sonic tunnel that exists on the ground floor. This piece of the building is also an important part of the master plan for the entire sports district site. The tunnel would be activated by a series of moving lights and images and would emit sounds as people move through it. These tunnels are apart of the site circulation patterns and lead people towards their destinations.

Critical Design Commentary

In the conclusion of my thesis document I established a set of guidelines that I hoped to follow as I transitioned from the written phase into the design phase of the thesis process. The guidelines were as follows:

1. incorporate the use of the three elemental forms described by Michael Southworth in "The Sonic Environment of Cities"
2. incorporate the use of natural and intentional sounds to mask the unnecessary and unwanted sounds of the city

With these in mind, my goal was to create an architecture that was visually stimulating and used sound to enhance the visitor's experience.

I believe that the final design did what I set out to accomplish. By using sculptural pieces that act as visual and sonic signs within the master plan, the design served to be both informative and suggested more user involvement. These sculptural pieces suggested movement, and asked for site visitors to interact with the space around them.

I struggled with two main issues during the design process: the design of the master plan and the structure of PACT. The master plan was challenging because the few buildings that did exist on the site only dictated the movement of people through the space but did not make a great suggestion as to building placement. The structure needed to be as light as possible to maintain the concept of keeping the ground floor as open as possible. The structure had to be substantial enough to support the 350-seat auditorium and box theater.

While I believe that my final design did include the original set of guidelines and met the final goal, there are still elements that I had hoped to strengthen in time for the presentation. One of the main comments in the final presentation seemed to resonate that what needed work was the overall way in which sound was used in the design. By providing the sculptural piece, I was suggesting a solution but the final outcome was not completely defined.

Paul Lukez suggested that I should have looked at mapping out the sonic patterns of the site more concretely. While this was something I had hoped to accomplish, I had been unable to determine the best way to find this information and used my personal knowledge of the site as a guide to determining the sites sonic condition. I received the most positive feedback when we discussed the sonic sculptural pieces found on

the site (the Sonic Mushroom and Sonic Tunnel). It was also suggested that I could have designed a way to bring the shapes of the sculptural pieces to the interior of PACT. By doing so, a more direct connection would have been made between the interior and exterior spaces.

The thesis process has taught me how to look at architectural design with a critical eye while also coming up with creative solutions to the built environment. I hope to continue my exploration of the use of sound in architecture as a foreground element of design. I feel that by engaging all of the human senses, architecture can harbor a rich experience of the way that we view the world.