

Cultivate L.A.

Converting the Los Angeles Memorial
Sports Arena into an Urban Food Hub

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ABSTRACT

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The collective experience of watching a world record broken or your team win a national title fosters a sense of community beyond the act of competition. Similarly the “shared meal” elevates the act of eating from a mechanical process to a ritual of family and community.

This thesis proposes a new type of urban agriculture that converts an obsolete sports arena into a community food hub for South Los Angeles. By transforming the Los Angeles Memorial Sports Arena into an urban food hub, it creates a venue for sharing within a community that is currently disconnected from their food.

Thank you to my family for their love and support,
my advisors for the continued guidance and
to my studio-mates for the motivation and laughter.

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“Cities are in reality great camps of the living and the dead where many elements remain like signals, symbols, cautions. When the holiday is over, what remains of the architecture is scarred, and the sand consumes the street again. There is nothing left but to resume with a certain obstinacy the reconstruction of the elements and instruments in expectation of another holiday.”

Aldo Rossi

A Scientific Autobiography

INTRODUCTION

Once the glitz and glamour subsides, the crowds disperse, and the Olympic hangover sets-in, what is left in its wake? Will the aftermath bring ruin or legacy? Cities like Beijing, Athens and Sochi exemplify Olympic cities overwrought with “White Elephants”.

In preparation for the Olympics, host cities work within an existing urban fabric to improve circumstances and design a new and enriched stage for the Games. The hope for many is that hosting the Olympics will propel their city to a new global status. The opening ceremonies in particular are a festival created in order to show off the history, the culture and the affluence of the host nation to a global audience.

Currently, the Olympic narrative ends with the closing ceremonies when in reality the story continues far into the future. The Olympic legacy endures in the form of Olympic villages, the stadiums, and the host city’s economic successes and failures. Often the high cost of maintenance along with poor planning, results in the premature obsolescence of these stadiums. These unused venues and the infrastructure remain as ruins; cautionary symbols

for the next host city. This thesis argues that these neglected and abandoned stadiums need to be addressed in a way that takes into account the existing urban fabric in order to preserve the Olympic legacy.

The Problem

Today, Olympic stadiums represent much more than a space for athletic competition. Host cities strive to out shine their predecessors for the most innovative, architecturally significant, and now sustainable, designs. Then, after the Olympics end, these stadiums become a part of the local culture, often as a symbol of the host city or a landmark in an urban context. Currently, these landmarks are permanent representations of a temporary event. This thesis investigates the link between landmark and heterotopia in order to understand the symbolic nature of the stadiums themselves and how that translates to Olympic architecture. This thesis posits that Olympic symbolism is attained through the surface or façade of the architecture.



Figure 1: Tiger Stadium in Detroit, Michigan

Similar to the problem of Olympic “white elephants”, many arenas across the United States once used by professional sports teams, have been abandoned in favor of newer stadiums with premium amenities. Looking specifically at Los Angeles, this thesis reacts to the issue of the obsolescence of sports infrastructure through a proposal to adapt these structures in a way that invites and encourages community engagement.

This thesis addresses Los Angeles and its history as an Olympic city through an analysis of the existing sports stadiums and focuses specifically on the Los Angeles Memorial Sports Arena.

Located in Exhibition Park, the arena sits on land that was once designated as Agricultural Park. Although the site is rooted in agricultural production and cattle ranches, the community today is completely disassociated from food production. Most of their calorie intake comes either from fast food or liquor stores.

Responding to the need to re-engage the community with food production, this thesis proposes to introduce production back into the urban fabric of the city by appropriating the Los Angeles Memorial Sports Arena as a Community Food Hub for South Los Angeles.

The goals of this thesis are to:

1. Retain the symbolic character and landmark status of the existing sports arena.
2. Bring food production back to the urban fabric of South Los Angeles through an aquaponic growing system.
3. Create opportunities within the project for the public to interact with and learn about the processes of urban agriculture.

RESURRECTION

SYMBOL

URBAN RENEWAL

COMMERCIALIZATION

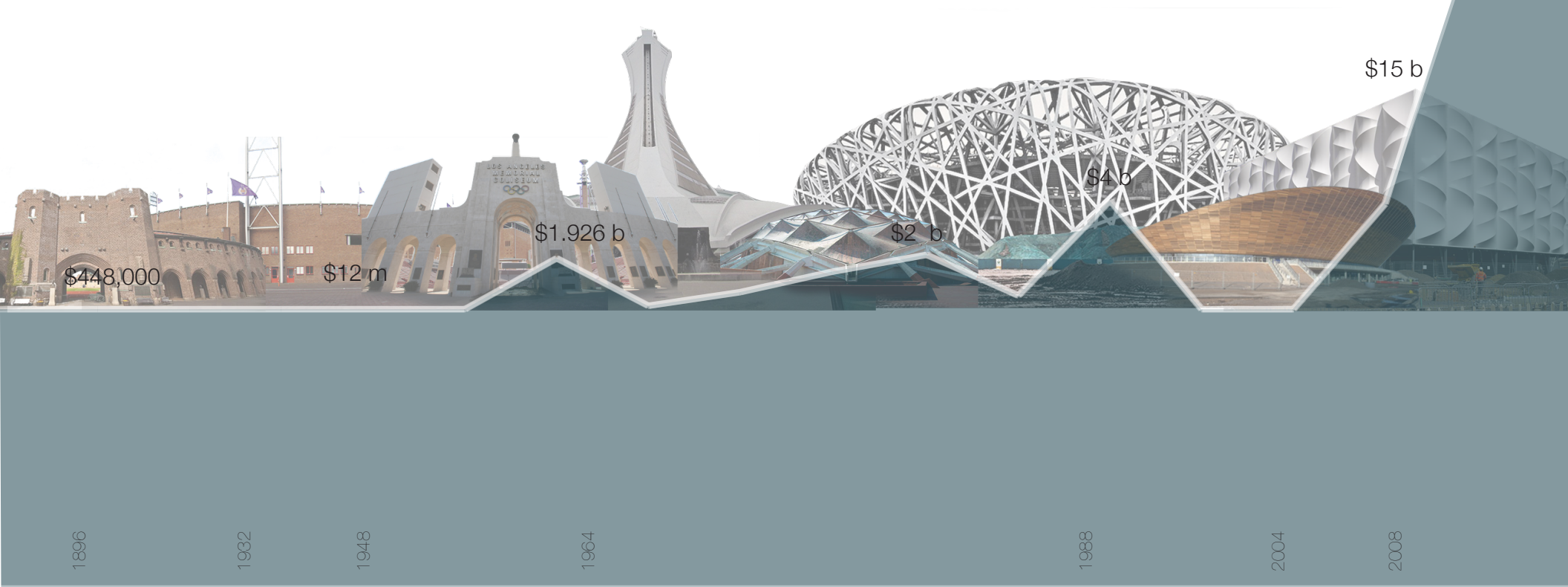


Figure 2: Olympic History

LITERATURE REVIEW

Olympic Landmark

Landmarks are simple physical elements varying in scale, often used as points of reference to the observer.¹ Urban planner Kevin Lynch's analysis of how cities are perceived characterizes a landmark as a singular, unique or memorable physical form, with permanence in a spatial location. Lynch argues that the Piazza San Marco in Venice and the Duomo in Florence are landmarks because they meet all three of these requirements. While not all landmarks are symbols, landmarks often become symbolic of a city or community.

Stadiums are not only a physical landmark for the community but also an icon or symbol of power, technological innovation and cultural prosperity. In the same way religious buildings were associated with technological innovation and cultural prosperity of the past, sports arenas are the depiction of prosperity and technological advancements of modern cities.

1. Lynch, Kevin. 1960. *The image of the city*. Cambridge, Mass: MIT Press, 78.



Figure 3: Bird's Nest in Beijing, China

The concept of the Olympic stadium as symbol is exemplified by the design of the 2008 Beijing Olympic main stadium. Beijing was determined to use the Olympics to create the perception of an international and modern city.² Designed by architects Herzog and de Meuron, the elliptical building employs steel beams, which stretch diagonally in all directions to create a latticework shell. This shell acts as both the façade and structure for the stadium. The Bird's Nest lives up to Beijing's aspirations as a symbol of Beijing's arrival to the international stage.

This thesis questions how stadiums gain meaning. An expert on the origins of architecture, Gottfried Semper discussed architecture's essential four elements: the hearth, roof, mound and enclosure. Looking at the element of enclosure, Semper believed that hanging carpets that hide structural walls remained the true walls because they were the visible boundaries of space.³ Semper's argument established a discourse between the difference

2. L. M. Li, A. J. Dray-Novey and H. Kong, *Beijing: From Imperial Capital to Olympic City*, 237-62.

3. Semper, Gottfried. *The four elements of architecture and other writings*, 104.

of surface and structure. According to Semper, buildings gain meaning through an analysis of their surface. This may be applied to stadiums in the way that the exterior façade can become representative of a city or team.

Rossi makes a similar argument for the importance of form.

According to Rossi, a monument's form is not tied to its function.⁴

Rossi argues that since monuments must be easily adaptable in order to stay relevant, the surface is what drives the permanence of the structure. The goal of this thesis is to retain the symbolic character and landmark status of the existing sports arena.

Olympic Heterotopia

The Olympics are temporal events, which result in the creation of an interstitial space. As designers we must question how to represent this heterotopia in our landmarks and symbolic buildings.

Michel Foucault argued for the existence of a space integral to society, which was simultaneously a mythic space and space in which society inhabits.⁵ According to Foucault, these in-between spaces take form in sacred spaces, rest homes, cemeteries,

4. Rossi, Aldo. *The Architecture of the City*, 60.

5. Foucault, Michel. *Other Spaces: Utopias and Heterotopias*, 7.

theaters, museums and festivals. He goes on to say that festivals are linked to time in its most flowing, transitory and precarious aspect.⁶ Like these festivals, the Olympics are temporary and transient events. In the case of the Olympic festival, two forms of heterotopia come together. The first heterotopia is that of the temporal festival and the physical site. The second is that of the accumulated history of the festival and the history of the host city. Olympic cities can be seen as a juxtaposition of the ambulatory event and the city in which it resides. The venues and stadiums reside within the space of the in-between.

This thesis posits that Olympic venues should be designed to reflect the temporal nature of the event. The objective is thus to create an experiential physical environment of both the present and the past.

Permanence and Local Use

According to Aldo Rossi “monuments, signs of the collective will as expressed through the principals of architecture, offer themselves as primary elements, fixed points in the urban fabric.”⁷ Olympic

6. Foucault, Michel. *Other Spaces: Utopias and Heterotopias*, 7.

7. Rossi, Aldo. *The Architecture of the City*, 22.



Figure 4: Los Angeles Memorial Coliseum in Los Angeles, California

Stadiums remain as fixed points in the urban fabric much after the games are over.

Rossi described two different types of permanence: propelling elements and pathological elements. According to Rossi pathological elements are isolated forms of the past.⁸ These elements stand out in their context due to technological or social evolution. In contrast, propelling elements are a form of the past that people still experience.⁹ The Alhambra in Granada would be considered a pathological monument. The Alhambra is currently a

8. Rossi, Aldo. *The Architecture of the City*, 60.

9. Rossi, Aldo. *The Architecture of the City*, 60.

historical site that no longer functions as it was originally intended. Although it is a beloved, well used space that provides a base of tourism for Granada. In contrast, propelling monuments can be seen as persistent overtime. The example that Rossi gives for propelling monuments is the Palazzo della Ragione in Padua. Unlike the Alhambra, the Palazzo's physical form is able to assume different functions and continues to act as an important urban focus.

The concepts outlined by Rossi can be used to analyze past Olympic stadiums. The Los Angeles Coliseum is a propelling monument. The stadium was originally designed for the 1932 Olympic games, but was used again in 1984 and continues to function as a stadium for the University of Southern California (USC). The Coliseum is a symbol of Los Angeles' Olympic history that the community is still able to experience today. The Birds Nest in Beijing would be a pathological monument. It is an icon of Beijing's arrival as an international city. However, only six years after the Beijing Olympics have ended, the Birds Nest is already collecting cobwebs. The high price of maintenance and the inability to secure a tenant rendered the architecturally stunning



Figure 5: Plan for the Barcelona Olympics. The city used public funds for regeneration efforts in order to convince investors to get involved

monument lifeless. Today, the building suffers from “empty-nest syndrome” because it lags so far behind sustainable use.

In contrast, the Barcelona Olympic Games exemplifies successful planning. The Barcelona Olympic games were divided into four principal sites on the edge of the central city and connected by a large ring road, the Centuro de Ronda.¹⁰ The Centuro de Ronda

¹⁰. Rowe, *Building Barcelona: A Second Renaixenca*, 88.

and the addition of the four Olympic sites helped to complete the overall urban form. The four Olympic sites were the Olympic Ring on Montjuic, the Olympic Village and Port in Poblenou, Vall d'Hebron and an area near the University campus. Additional improvements were made to the airport and the entrances to the city.

Barcelona placed the site for the main Olympic venues for track and field, swimming, baseball and wrestling immediately behind the pavilions for the 1929 International Exhibition. For the main stadium, the architect Vittorio Gregotti worked with Correa and Mila to refurbish the Montjuic Municipal Stadium, originally designed in 1929. A brand new sports pavilion, designed by Japanese architect Arata Isozaki and partners showcased the largest space frame dome in all of Europe.¹¹ For the swimming pools Moises Galego and Francesc Fernansez refurbished the Bernat Picornell Swimming Pools originally designed in 1970 for the European Swimming Championships.

11. Rowe, *Building Barcelona: A Second Renaixenca*, 90.

Unlike the games of the last decade, most of the stadiums used for the Barcelona Olympics fit into the existing urban context.

Barcelona planned for four Olympic areas incorporating the objectives of the new scale of Olympic urban development.¹²

Twenty-seven of the thirty-seven competition venues were previously established and updated to host the Olympic Games. The others were in the planning stages or under construction. This was an attempt to avoid packing all activities into a single site, which would have been useful for the sixteen days of events with little social value afterwards.¹³ The areas chosen were near main thoroughfares and easily accessible by public transit. Traveling time between any two areas did not exceed 20 minutes.

The design of the Barcelona Olympic Village was the most ambitious urban project associated with the Olympic Games. The planning and design of the Olympic Village was seen as a way to rebuild a dilapidated part of the city and address the Mediterranean Sea coastline. The placement of the Olympic Village on the

12. Monclus, Francisco-Javier. "Barcelona 1992" in *Olympic cities: city agendas, planning and the world's games, 1896-2016*. 268.

13. Monclus, Francisco-Javier. "Barcelona 1992" in *Olympic cities: city agendas, planning and the world's games, 1896-2016*. 268.

waterfront was part of a bigger effort to regenerate the whole coastline of Barcelona.¹⁴ Barcelona was successful at utilizing the international celebration as the engine for important urban development transformations.

Global Use and Transience

The pursuit of permanence in architecture guides many design choices. As a western culture we often see our buildings as permanent, when in reality the average life span of our buildings is 30-50 years. For many, permanence equates with security while temporary is considered secondary or insignificant. In reality, material things are not eternal and everything appears to change, eventually. Designers need to accept this reality and begin to accommodate for change.

For the last 50 years culture has become increasingly nomadic. Many individuals choose to move through life as tourists with temporary employment contracts, volatile markets, change in partners, habitation and values.¹⁵ Such uncertainty requires individuals and the spaces they inhabit to be flexible and

14. Rowe, Building Barcelona: A Second Renaissance, 95.

15. Bishop, Peter and Lesley Williams. The Temporary City, 21.

adaptable. The transient nature of the Olympics requires similar flexibility and adaptability of Olympic venues.

The London Olympic Committee was the first city to acknowledge these needs and ran its campaign on the premise of sustainability and adaptability.¹⁶ During the planning for the 2012 London Games, the city questioned its predecessors and then re-envisioned methods of Olympic planning. The London Olympic committee looked at what sports the country excelled at and then chose venues for these sports as permanent structures. These buildings included a Velodrome and Olympic size swimming pool. The committee then decided to build temporary structures for the remaining facilities.

Since London was not known for basketball, the London Olympic basketball stadium was designed as a temporary structure that would be disassembled post-Olympics. The London Basketball Stadium was made up of an inner aluminum frame that supported seating for 12,000 people. It measured 35 meters high (as high as

16. Dunmall, Giovanna, "The Legacy Games; Forget the Olympic Games; it's all about what happens later." 98.



Figure 6: Undulating Facade of the London Basketball Arena



Figure 7: Basketball Arena London, England

the Tate Modern) and longer than a football pitch at 115 meters.¹⁷ The rectangular volume was wrapped in 20,000 square meters of lightweight recyclable polyvinyl chloride (PVC). The steel frame supporting the PVC was designed to create an undulating pattern across the façade of the stadium. The skin allowed for the filter of daylight to the interior during the day and the filter of artificial light to the exterior at night. Furthermore, the use of parametric modeling allowed for iterative dimensional modifications of a highly detailed overall model.

The architects attempted to mask the temporary nature of the structure through the use of an undulating form, reminiscent of a portable typology. While there were plans to ship the basketball arena to Rio de Janeiro for the 2016 Olympic Games, the steel contractor was unwilling to ship the structure to Rio, and the Brazilians were reluctant to trust a different company. In the spring of 2013, the construction company Barr Construction put the arena up for sale for £2.5 million. Jim Eyre, principal of Wilkinson Eyre Architects, admitted that his only regret about the London temporary basketball arena is that “there was no premium allowed

17. Dunmall, Giovanna, “The Legacy Games; Forget the Olympic Games; it’s all about what happens later.” 95.

to make it more flexible, to turn it into more of a system that could be reconfigured.”¹⁸

The character of the temporary Olympic Basketball Arena draws its inspiration from the typology of portable dwellings of the past. Aerospace engineering professors Adrian Beukers and Ed van Hinte discussed two major principles of portable dwellings. The first (the prevailing process) is the process of spanning cloth with tension wire over portable poles. Nomadic people mostly use this process.¹⁹ The second principle is a more permanent solution, where mats are draped around more elaborate wooden framework that can stand on its own.²⁰ The basketball arena mimics the first nomadic principle of stretching fabric with tension wire over a temporary structure.

Beuker and Hinte also advocated for the utilization of the principles of lightness in terms of economic development. This may be

18. Dunmall, Giovanna, “The Legacy Games; Forget the Olympic Games; it’s all about what happens later.” 95.

19. Beukers, Adriaan, and Ed van Hinte. *Lightness: the inevitable renaissance of minimum energy structures*, 137.

20. Beukers, Adriaan, and Ed van Hinte. *Lightness: the inevitable renaissance of minimum energy structures*, 137.

applied to the Olympic Games and the need for sustainable economic development of host cities. The money spent by countries to host the games seems unjustifiable and the entire process is considered unsustainable when many of the stadiums are abandoned after the games. As demonstrated by the London Olympic basketball arena, Olympic host cities are beginning to design venues with elements of lightness and sustainable principles.

The elements outlined by Beuker and Hinte are used as a basis to judge the lightness of the London 2012 Basketball Arena.

The first element, considered the most important, is meeting the need of the people: housing, food, transport, and clothing.²¹

The basketball arena met the needs as a venue for hosting an Olympic sport. Secondly, as demonstrated by the Wilson and Eyre Basketball Arena, lightness fulfills function with a significantly lower environmental impact. The next element deals with the way in which materials and resources move through the economy. The basketball arena was designed to have the capability to be taken apart and shipped to a new location and used again. The

21. Beukers, Adriaan, and Ed van Hinte. *Lightness: the inevitable renaissance of minimum energy structures*, 111.

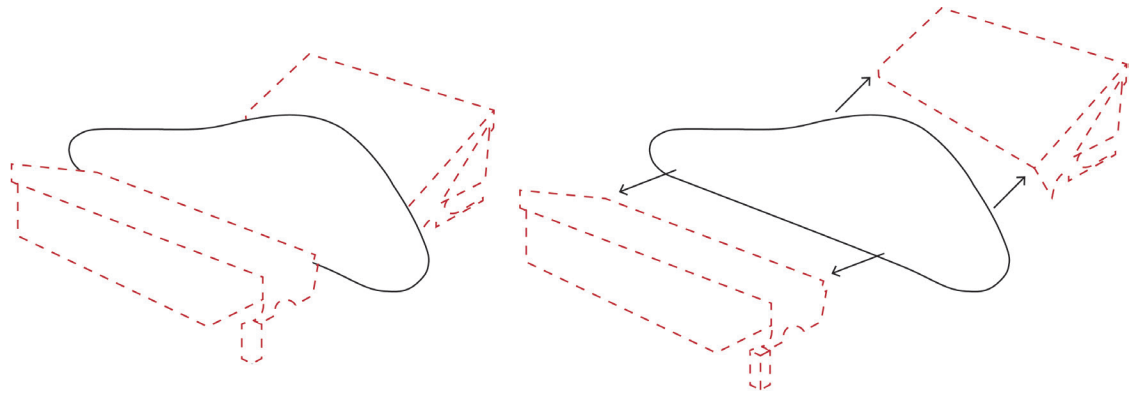


Figure 8: Planned disassembly of the London Aquatics Center London 2012 Olympics

parts could also be dismantled and recycled or reused for multiple different functions. The arena fits the elements outlined by Beuker and Hinte, demonstrating that the stadium not only looks light but is also an economically sustainable solution.

In the last twenty years, Olympic cities have begun to acknowledge the issues of sustainability and the premature obsolescence of Olympic venues. In particular, Universities and the IOC are beginning to take-on the issue of post-occupancy of these venues. From this research a set of three typologies for Olympic stadiums may be developed. These typologies include demolition

or abandonment, use-as-is, and adaptation.²² In the first two scenarios stadiums or venues built for the Olympic Games are left as-is. The Bird's Nest, in Beijing is an example of abandonment of Olympic stadiums, while the Los Angeles Olympic Coliseum is representative of use-as-is.

Within the third typology of stadium adaptation there are three subcategories.²³ These subcategories are the adaptation by

22. Lehman, Rebecca T. After the games: the planning, construction, and after-use of Olympic stadiums, 26.

23. Lehman, Rebecca T. After the games: the planning, construction, and after-use of Olympic stadiums, 27.

removal of temporary structures, the adaptation by removal of parts of permanent structures and the wholesale reuse of mega-event structures. The 2012 London Olympic Basketball Arena provided an example of the removal of temporary structures after the games (though the process did not go as intended). The arena was designed so it could be disassembled, 'flat-packed', shipped to Rio de Janeiro and then reused for the 2016 games.

The second adaptation strategy that has had considerable amount of success is demolition of parts of a permanent stadium. This strategy was employed in the design of the 2012 London Olympic Swimming Stadium (Figure 10). Zaha Hadid Architects designed the swimming stadium with detachable wings that added additional seating for the Olympic events. While architect Jim Heverin admitted that from the outset that the addition of the wings were a definite compromise to the design, he acknowledged that they were never meant to be permanent.²⁴

The third strategy is to bring another use to the stadium. Both the Watercube in Beijing and the Montreal Olympic stadium are

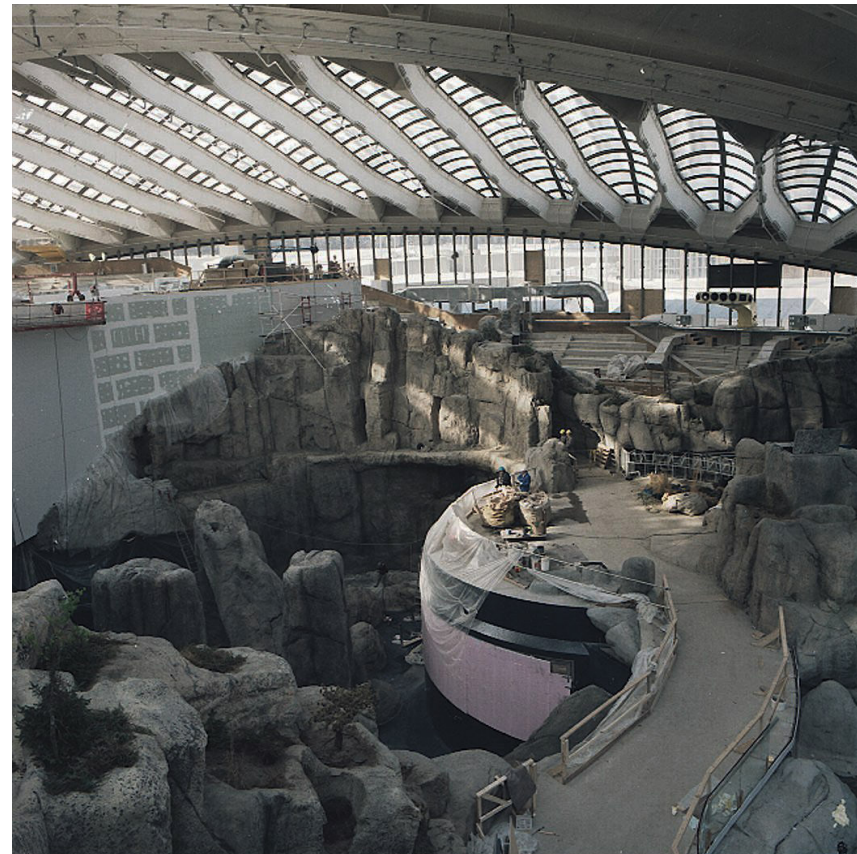


Figure 9: Montreal Biodome Montreal, Canada

24. Dunmall, Giovanna, "The Legacy Games; Forget the Olympic Games; it's all about what happens later." 85.

successful examples of this third strategy. Half of the Watercube has been converted into a successful indoor water park and the Montreal stadium is now a biodome which houses more than 4,800 animals of 230 species and 750 plant species in four different ecosystems all under one roof. All three of these adaptation strategies provide the Olympic narrative with a proper end that has previously been missing from the story. This thesis will further explore the third adaptation strategy.

While strategies for adaptation are not a new concept in architectural practice, they are often divided between the temporary and the permanent. Permanent structures become landmarks or symbols of a community while temporary structures are symbolic only for the time they are up. This thesis aims to explore ways to create experiences in architecture similar to the Olympic heterotopia, by blending concepts of both permanence and temporary. The objective of this thesis is to bring together the feeling of lightness associated with the temporal nature of the games with the legacy Los Angeles' legacy as an Olympic city. As stadiums are often experienced in large crowds, televised or streamed online, this thesis will explore surface as an architectural

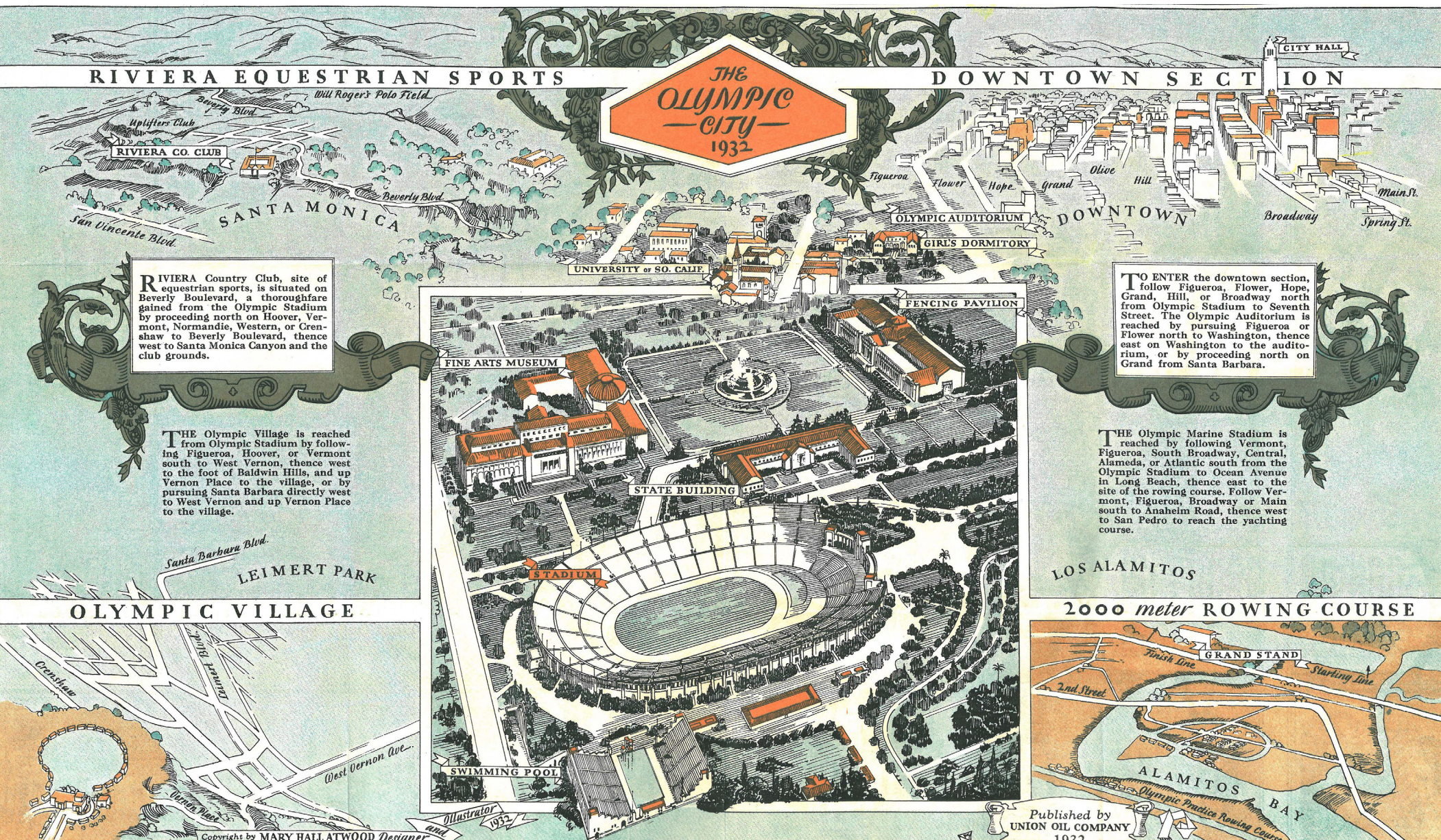
medium for portraying meaning.

This thesis draws upon the theoretical arguments of landmark, heterotopia, and the Olympic narrative in a constructivist analysis of the Olympic Games. Drawing on Aldo Rossi and Kevin Lynch's discussions of monument and landmark, it posits that stadiums function as a landmark and symbol for the city. Foucault describes festivals as heterotopic events in between utopia and reality. In this way, the Olympic Games may be considered temporal events, bridging between mythological space and reality. This thesis proposes that Olympic venues should celebrate both the symbolic and temporal qualities of the games.

“In no other city but Los Angeles have the Olympics so completely shaped metropolitan identity- not even in modern Athens. Los Angeles used the 1932 games to put itself on the global map. The city used the 1984 games to redefine its image to the world. The Olympics helped Los Angeles to make itself the capital of the world’s popular culture industry. The Los Angeles’ Olympic productions have provided enduring lessons in how to use the games to market nations to the world.”

Mark Dyreson and Matthew Llewellyn

Los Angeles is The Olympic City



RIVIERA EQUESTRIAN SPORTS

DOWNTOWN SECTION

THE OLYMPIC CITY
1932

RIVIERA Country Club, site of equestrian sports, is situated on Beverly Boulevard, a thoroughfare gained from the Olympic Stadium by proceeding north on Hoover, Vermont, Normandie, Western, or Crenshaw to Beverly Boulevard, thence west to Santa Monica Canyon and the club grounds.

THE Olympic Village is reached from Olympic Stadium by following Figueroa, Hoover, or Vermont south to West Vernon, thence west to the foot of Baldwin Hills, and up Vernon Place to the village, or by pursuing Santa Barbara directly west to West Vernon and up Vernon Place to the village.

TO ENTER the downtown section, follow Figueroa, Flower, Hope, Grand, Hill, or Broadway north from Olympic Stadium to Seventh Street. The Olympic Auditorium is reached by pursuing Figueroa or Flower north to Washington, thence east on Washington to the auditorium, or by proceeding north on Grand from Santa Barbara.

THE Olympic Marine Stadium is reached by following Vermont, Figueroa, South Broadway, Central, Alameda, or Atlantic south from the Olympic Stadium to Ocean Avenue in Long Beach, thence east to the site of the rowing course. Follow Vermont, Figueroa, Broadway or Main south to Anaheim Road, thence west to San Pedro to reach the yachting course.

OLYMPIC VILLAGE

LOS ALAMITOS

2000 meter ROWING COURSE

Copyrights by MARY HALL ATWOOD Designer and

Published by UNION OIL COMPANY 1932

Figure 10: Map of 1932 Los Angeles Olympics Games

SITE ANALYSIS

This thesis uses Los Angeles to test ideas formed in the literature review. The city was chosen because of the way that the Olympics have shaped the urban environment as well as the way the city has shaped the Olympic Games.

Los Angeles has been a global city from the start.²⁵ Initially developed as a Spanish colony to protect trade routes to Asia, Los Angeles grew due to the cattle ranching boom associated with the Gold Rush. The twentieth century brought the human-made Ports of San Pedro Bay, the Owens River and Colorado River aqueducts and the Department of Water and Power's hydroelectric plants generated cheap energy, in turn attracting Eastern industry after World War I.²⁶ Funding from the federal government aided Los Angeles in building public works projects, which resulted in the explosive economic growth, expansion and later suburban development, associated with Los Angeles today.

25. Publos, Louise. *Born Global: From Pueblo to Statehood*. 219.

26. Publos, Louise. *Born Global: From Pueblo to Statehood*. 219.

The creation and promotion of the city's image remained an important factor throughout the regional growth of Los Angeles. The construction of place along with the simultaneous emergence of popular culture resulted in the rise of Los Angeles as a modern city.²⁷ In the early years, the city promoted Los Angeles as an agricultural center and marketed the region's farming image. Then, the late nineteenth century brought about the Los Angeles Chamber of Commerce, which focused on promotion of the city. A shift in values toward enjoying everyday life resulted in a promotional shift to an easy, laidback lifestyle. By the early 1930s Los Angeles grew into America's fifth largest city.²⁸

After World War I the mayor established the Community Development Association (CDA) in order to boost tourism. In the CDA's first meeting members suggested that Los Angeles apply to host the Olympic Games.²⁹ In 1923 Los Angeles won the bid

27. Burbank, Matthew, Gregory D. Andranovich and Charles H. Heying. "Los Angeles and the 1984 Summer Games." 209.

28. Burbank, Matthew, Gregory D. Andranovich and Charles H. Heying. "Los Angeles and the 1984 Summer Games" 209.

29. Burbank, Matthew, Gregory D. Andranovich and Charles H. Heying. 2012. "Los Angeles and the 1984 Summer Games" 210.

to host the 1932 Summer Games in the Los Angeles Memorial Coliseum, which was the largest sports arena in the country. Los Angeles spent \$100,000 on 30,000 palm trees meant to spruce up the streets associated with Los Angeles urban sprawl. Now, palm trees are iconic representations of southern California and symbols of Los Angeles. Seven years after the 1932 Olympics, Los Angeles established the Southern Committee for the Olympic Games (SCOG) with the hopes of bringing the games back to Los Angeles.

The next time Los Angeles hosted the Olympics was over half a century later in 1984. Several other US cities were interested in hosting the games, however all but Los Angeles would require federal aid. After Tehran dropped out of the running, Los Angeles was the sole city willing to host the games. In Los Angeles' bid the city proposed to host the Olympic Games in a "spartan" and businesslike manner, without any state or federal aid. Los Angeles won the Olympic bid in the summer of 1978. By spreading out the games and using already built venues throughout Los Angeles and neighboring counties, the city was able to minimize new construction. The commercialization of the Olympic Games resulted in the first time that a host city recorded a profit.

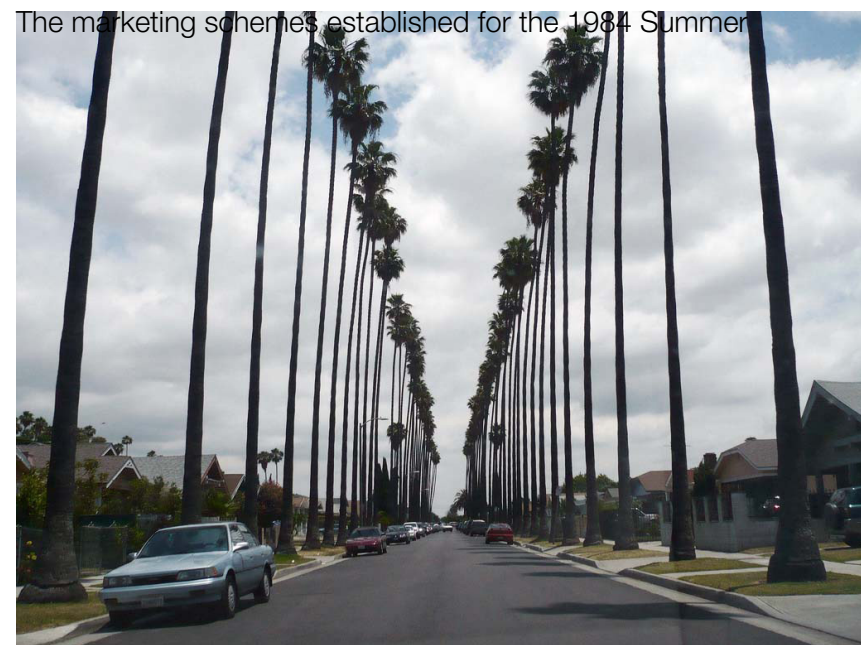


Figure 11: Iconic Los Angeles Palm Trees Road lined with palm trees planted for the Olympic Games

Olympics succeeded in creating a positive image of the city. Televised worldwide, the Olympics stimulated a persuasive marketing campaign for Los Angeles after the Games.



Figure 12: Liquor Store in Los Angeles, California

Food Insecurities in Los Angeles

California has often been referred to as the “bread basket” of the world.³⁰ According to the California Department of Food and Agriculture, the state is the fifth largest supplier of food and agricultural produce. Some of the leading products include dairy, grapes, almonds, walnuts, varieties of fresh fruit and vegetables. Because of California’s mild Mediterranean climate, many of these crops are exclusive to California and cannot be grown in the rest of the United States.

The history of Los Angeles, in particular is rooted in agriculture. Until well into the 1900s farming remained an integral part of the local economy. In 1817, there were an estimated 53,686 grape vines under cultivation in the lowlands along the Los Angeles River.³¹ By 1870 that number had grown to 6 million. In 1872, the site now known as Exposition Park was created and named

30. “EB5 Northern California - Breadbasket Of The World.” EB5 Northern California - Breadbasket Of The World. Accessed December 8, 2014. <http://eb5northerncalifornia.com/index.php?page=breadbasket-of-the-world>.

31. Gumprecht, Blake. 1999. *The Los Angeles River: its life, death, and possible rebirth*. Baltimore: Johns Hopkins University Press. 47.



Figure 13: Orange Groves in Los Angeles, California



Figure 14: Agricultural Park Los Angeles, California

Agricultural Park. Agriculture Park was meant to encourage new American landowners to take up farming. Citrus groves soon appeared, designed to be symbols of Southern California's fertile climate. As land in Los Angeles County became more valuable the farms were pushed out into the valley and the city lost its connection with growing and food production. Now urban residents buy their food from restaurants, grocery stores or local convenience stores without any idea of origin.

Currently Los Angeles is experiencing the worst drought in the last 1,200 years. According to a report by University of Minnesota researchers, the drought of the last few years is exceptionally severe in the context of the last millennium.³² While California came out of droughts in the past, it is the heat and not the amount of rainfall that is causing the current situation and temperatures are projected to keep on rising. The heat bakes the moisture out of the soil worsening the effects of the drought. These conditions are testing the water reserves in the fertile San Joaquin Valley. Growers

32. Totten, Sanden. "Calif. Drought Is the Worst in 1,200 Years, New Study Says." Southern California Public Radio. Accessed December 10, 2014. <http://www.scpr.org/news/2014/12/05/48481/drought-california-s-dry-spell-is-the-worst-of-the/>.



Figure 15: Farmer in California loses 1,000 acres of almond trees due to the current California drought

are forced to rely on water pumped from wells for growing crop production, depleting the groundwater supply. Other strategies include leaving some land idle in order to divert water to other acreage. The impact is felt across the country as almost every nut and grape eaten in the United States comes from the valley.

The United States Department of Agriculture (USDA) defines a food desert as an urban neighborhood or rural town without easy access to fresh, healthy and affordable food.³³ Instead of

33. "Creating Access to Healthy, Affordable Food." Agricultural Marketing Service - Creating Access to Healthy, Affordable Food. Accessed December 7, 2014. <http://apps.ams.usda.gov/fooddeserts/fooddeserts.aspx>.



CA drought gradient map



99% of all US almonds



99% of all US walnuts



98% of all US pistachios



95% of all US broccoli



92% of all US strawberries



90% of all US tomatoes



90% of all US tomatoes



74% of all US lettuce

Figure 16: Crop maps of California

supermarkets, food deserts are mainly served by liquor stores and fast food restaurants. The lack of access to fresh, healthy food results in poor diet, high levels of obesity, heart disease and other health issue. This does not mean a lack of access to food all together, but rather a lack of access to healthy food options and knowledge of these options. The USDA estimates that approximately 23.5 million people currently live in a food desert.³⁴ Over half of the population is considered to be low-income.

Exhibition Park, the site for this thesis, is located in South Los Angeles. Situated in between I-110 and I-10 and directly south of the University of Southern California. South Los Angeles is considered to be a low-income area with 48 percent of the population of Hispanic origin. A large percentage of these residents do not own a car and live further from a walk-able half-mile radius to a local grocery store.

While the issues of grocery stores can seemingly be fixed by adding more grocery stores, research shows, that this is not the

34. "Creating Access to Healthy, Affordable Food." Agricultural Marketing Service - Creating Access to Healthy, Affordable Food. Accessed December 7, 2014. <http://apps.ams.usda.gov/fooddeserts/fooddeserts.aspx>.

end all solution to the problem. In order to combat these food deserts, there also needs to be education and engagement with food among the community. In 2013, the University of California, Master of Urban and Regional Planning Comprehensive Capstone research team, put together a document that looked at the state of urban agriculture in Los Angeles County in 2013. Their studies found that since the early 21st Century, there has been an upswing of urban agriculture, mainly found in school gardens.³⁵

This thesis proposes engaging with the community in order to bring awareness of where the food is coming from, educate the community on in-door food growing systems and provide a supplemental source of fresh food for the area of South L.A.

This project responds to the history of exposition park, the drought conditions in California and food insecurities in South Los Angeles with a proposal for urban farming in the Los Angeles Memorial Sports Arena.

35. Jackson, Jaemi, Kelly Rytel, India Brookover, Nicholas Efron, Genevieve Hernandez, Erik Johnson, Youngun Kim, Wenchong Lai, Mayra Navarro, Alba Pena, Zachary Rehm, Hyecong Yoo, Laurel Hunt, Jessica Howen McBride, Matthew Rising, and Carol Goldstein. Cultivate L.A. An Assessment of Urban Agriculture in Los Angeles County. 2013.



Figure 17: Aerial View of Exposition Park

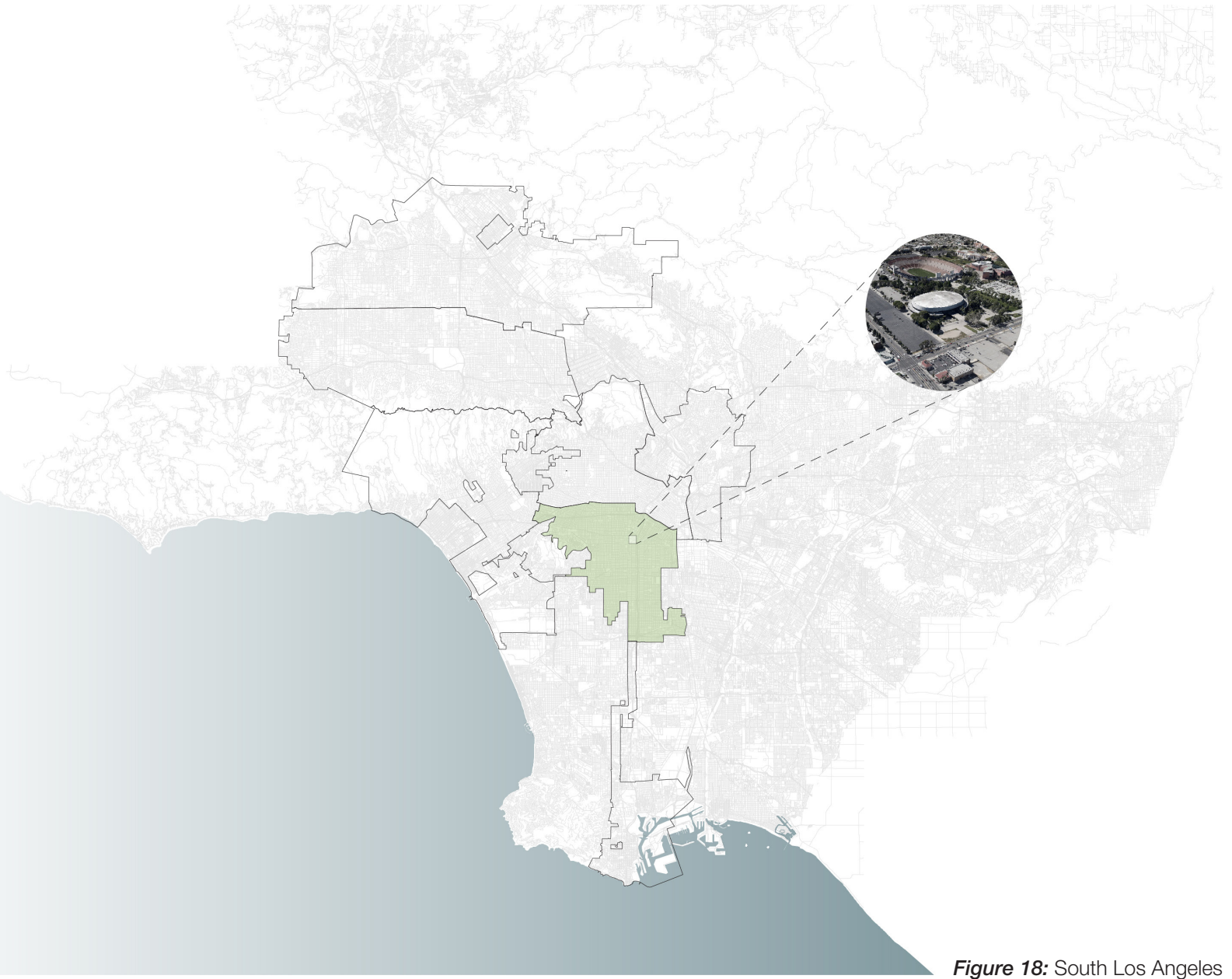


Figure 18: South Los Angeles

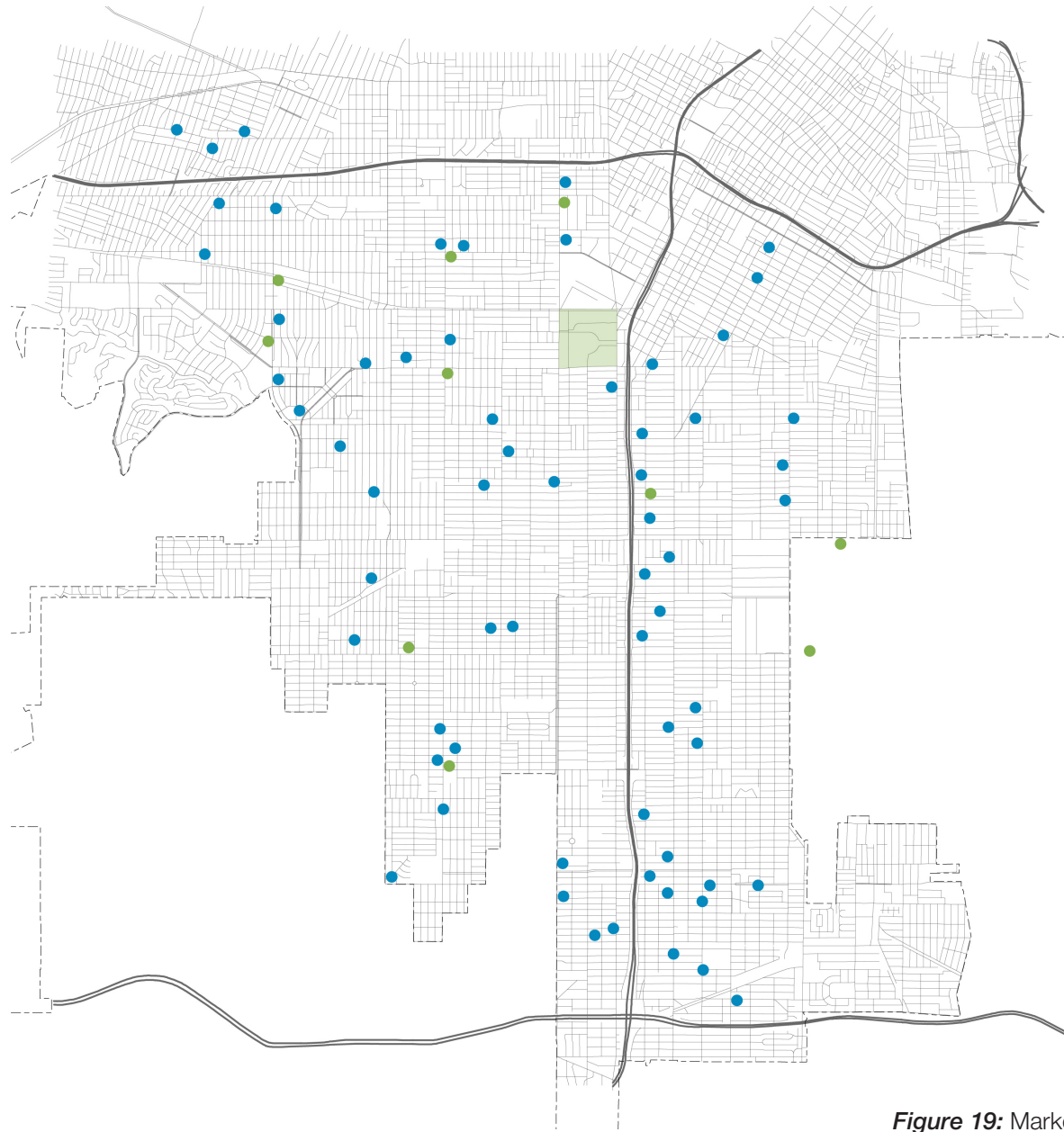


Figure 19: Markets in South Los Angeles

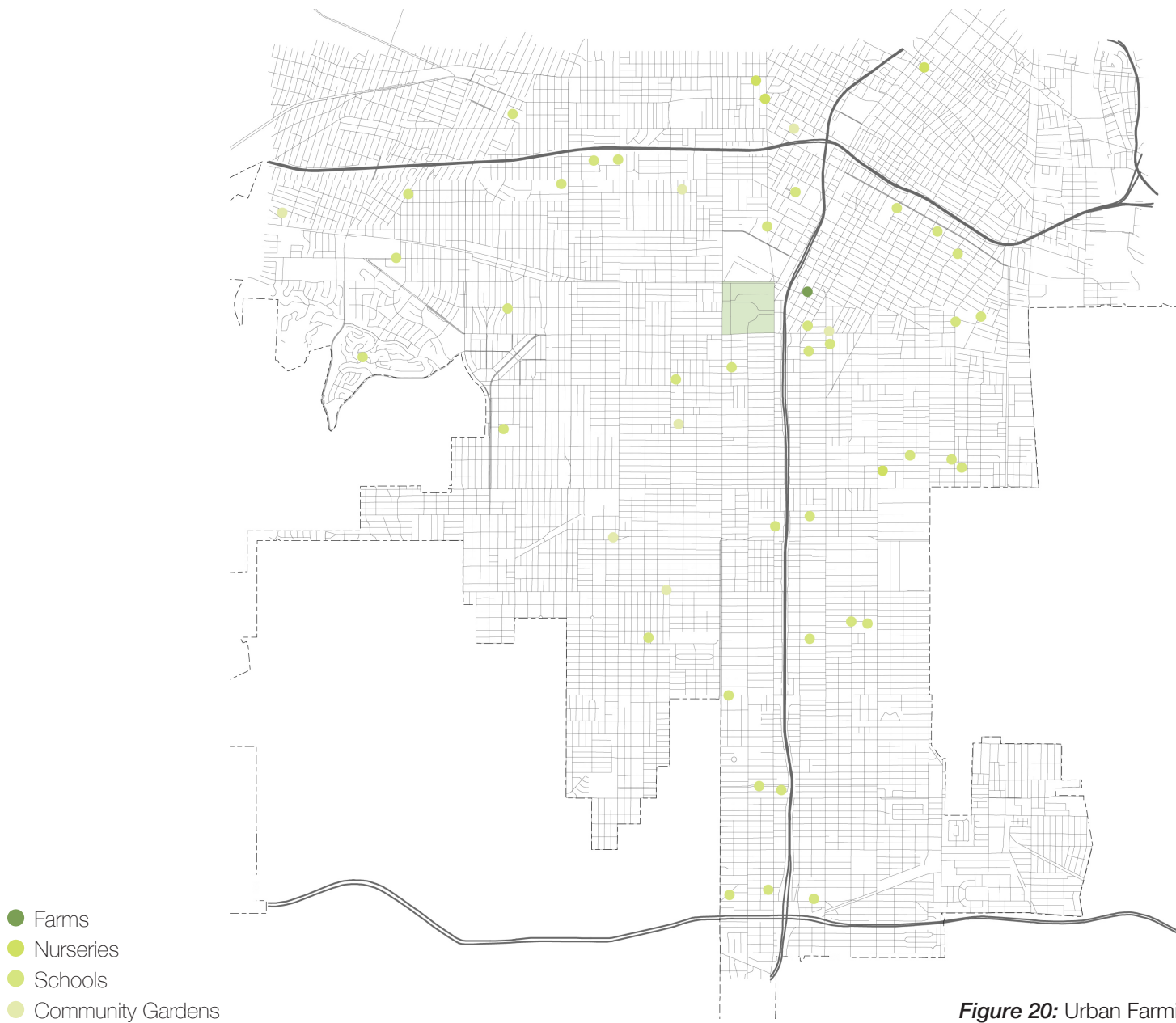


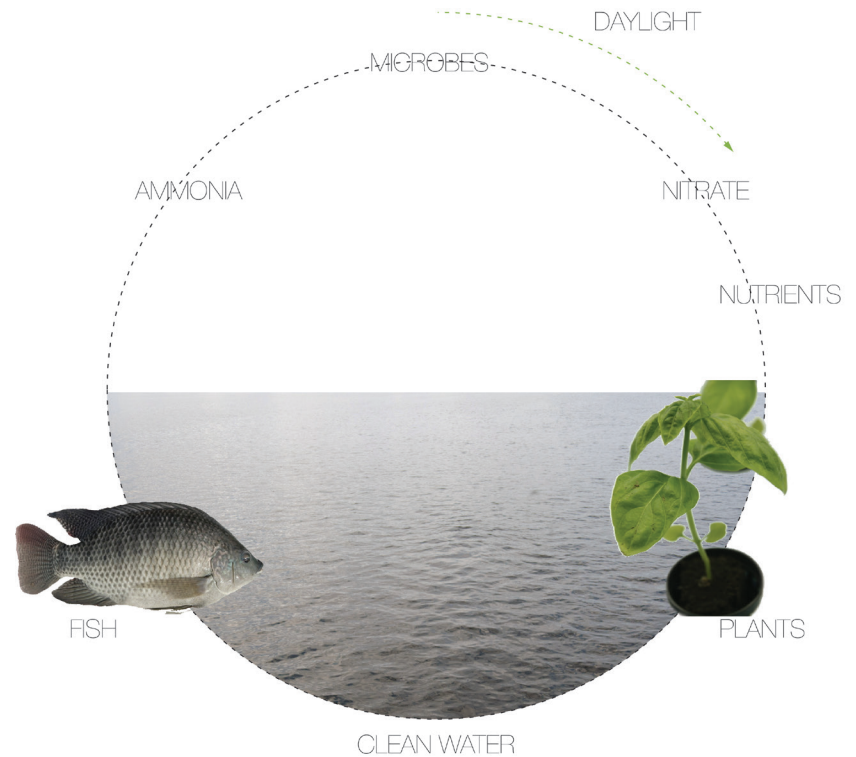
Figure 20: Urban Farming in South Los Angeles

URBAN AGRICULTURE

Growing Systems

Aquaponics

Aquaponics is a growing system that creates a closed cycle of symbiotic relationships between fish and plants.³⁶ Aquaponics uses no chemicals and one tenth of the water needed for field plant production. Fish supply the nutrients to a bed of plants and the plants then clean up the water that is used in the fish tanks, creating a mutually beneficial environment for both. External inputs include food for the fish as well as supplemental nutrients for the plants.

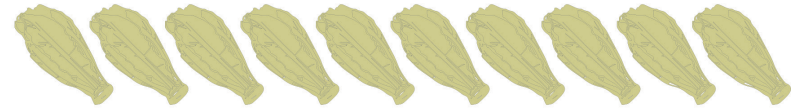


36. Hallam, Murray. "What Is Aquaponics?" Murray Hallams Practical Aquaponics. Accessed December 8, 2014. <http://practicalaquaponics.com/blog/learn-about-aquaponics/what-is-aquaponics/>.

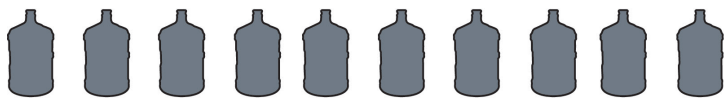
Figure 21: Aquaponic Growing Diagram



33,000 lbs / year



300,000 lbs / year



Traditional Farming Methods



Aquaponics **Figure 22: Food Production and Water Conservation**

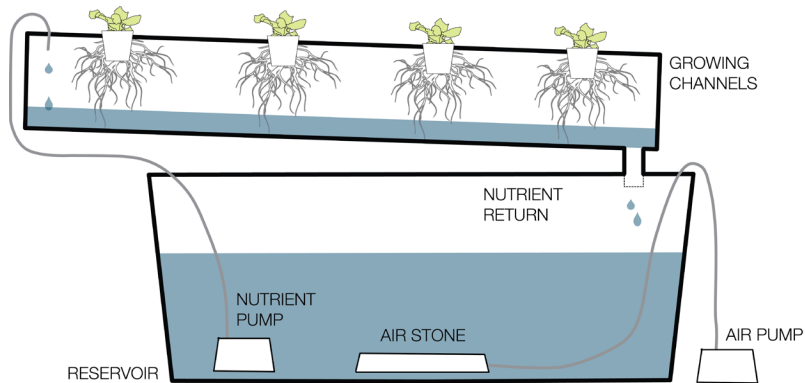


Figure 23: Nutrient Filtration Technique

Nutrient Film Technique

The proposed Community Food Hub uses a nutrient filtration technique in which fish water is pumped to channels where plants are grown and is then evenly distributed by a system of pipes. The nutrient enriched water keeps the plants moist as it filters through, returning to the fish tank by gravity. The water is cleaned by the plants and used by the fish, continuing the cycle. Earthworms are raised to feed the fish and their compost is then used in other parts of the garden.



Figure 24: Nutrient Delivery System



Figure 25: Image of the Nutrient Film Technique (NFT) implemented at Lufa Farm in Montreal, Canada

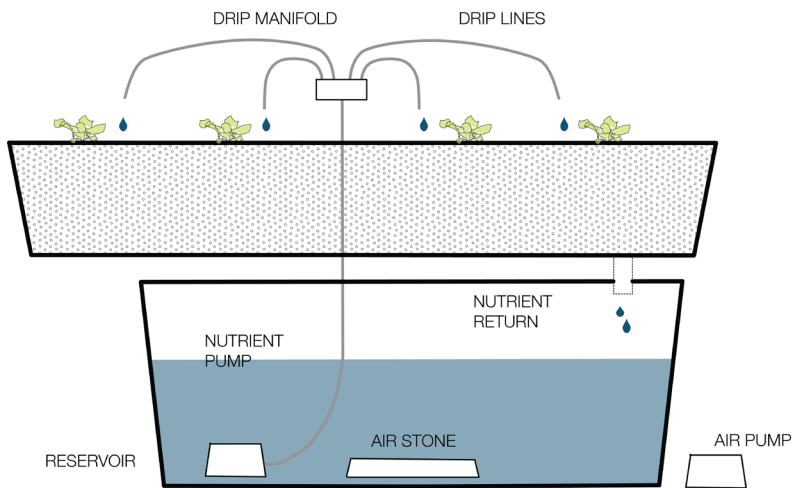


Figure 26: Drip System

Drip System

The drip system is probably the most used indoor farming method in the world. In the drip system, a timer turns a pipe on and a nutrient solution is dripped onto the base of each plant by a small drip line. The excess nutrient solution that runs off is then recovered for re-use. Timers can be costly and difficult to calibrate, however since the run-off is recovered and re-circulated there is more room for error.



Figure 27: Tomatoes grown hydroponically



Figure 28: Bato bucket hydroponic growing

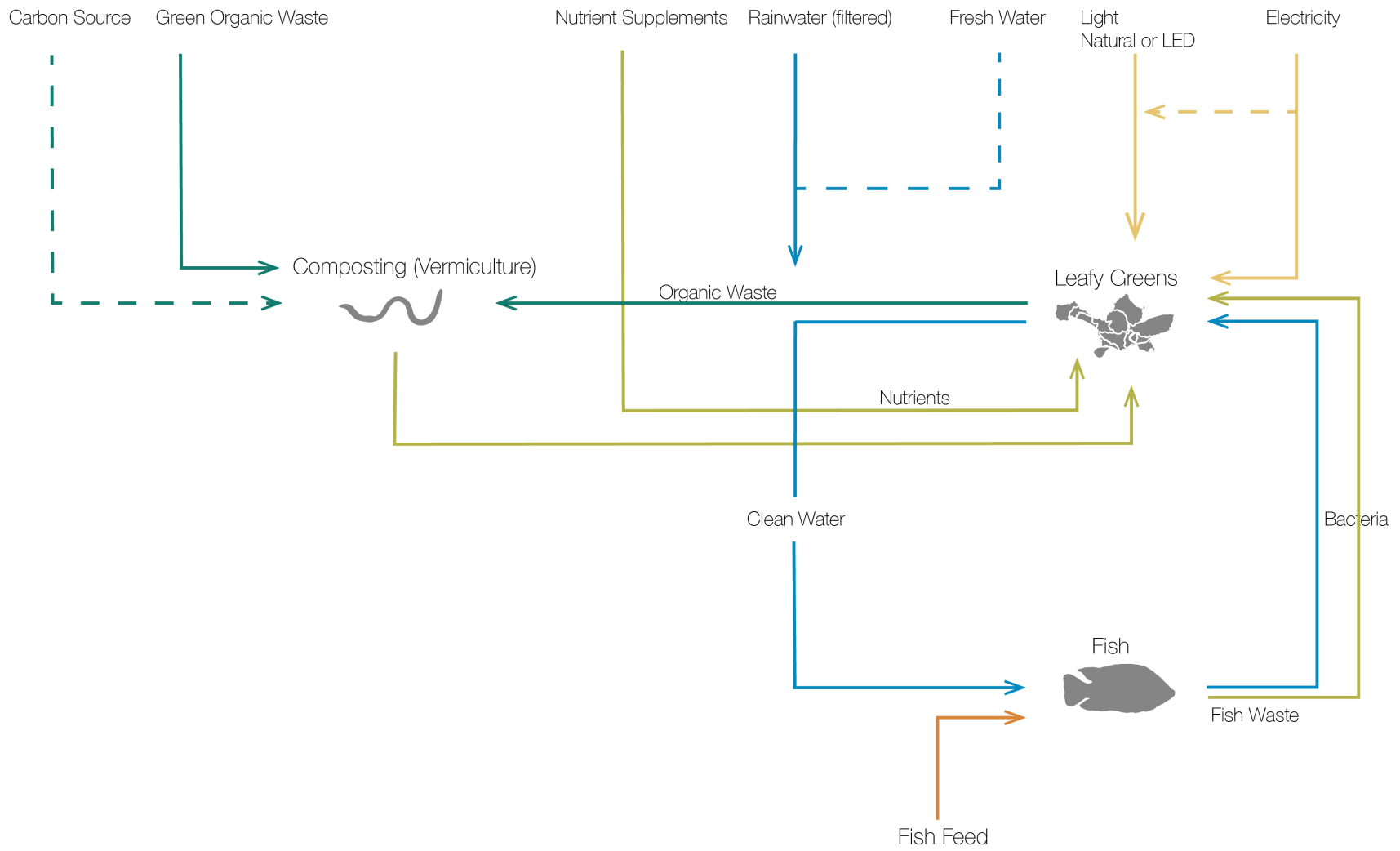


Figure 29: Aquaponic systems

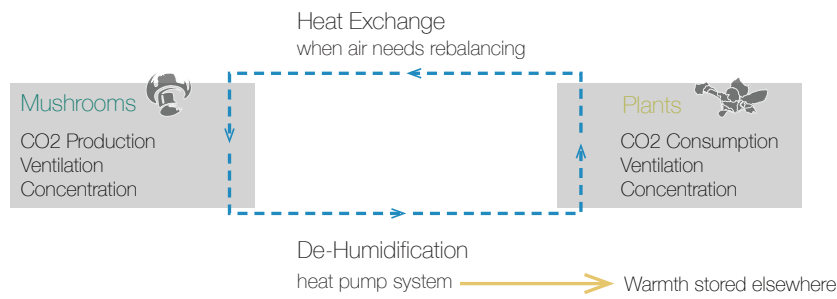


Figure 30: CO₂ Exchange

Air Quality Control

Mushroom Cultivation

One of the main principles of an indoor commercial growing system is the sealed nature of the space. Similar to the symbiotic quality of the aquaponic system, another symbiosis can occur within the greenhouse in order to stabilize air quality. Mushrooms create CO₂ and plants need CO₂ to survive. Looking at Alpha Farm as a precedent, this thesis proposes to recirculate air between mushrooms and the growing areas.³⁷ In this process the air in the

greenhouse is depleted of CO₂, becoming very humid. This air is then fed to the mushroom growing areas, through a dehumidifier, and then back to the plants with replenished CO₂. During the warmer months the greenhouse will be ventilated along the perimeter of the roof to draw cool air in and expel some of the moisture. An additional cooling system would most likely also be needed, but not enough calculations have been done at this time.

37. Baker, Charles, John Sampson, Nick Dodd, and Ciara Maurel. Alpha Farm: A Scaleable Schematic Design. Manchester International Festival, 2011. 16.

DESIGN

The adaptation of the Los Angeles Memorial Sports Arena into a Community Food Hub for South Los Angeles demonstrates the significant potential for growing food in an existing structure within an urban context. New elements of the structure such as ETFE roof and façade and the extensive site, clearly establish and promote the change in function which, in turn creates a sense of curiosity and interest that draws the community to the Food Hub.

Program

Converting the Sports Arena into an Urban Food Hub provides benefit to the surrounding community on several levels. First, it connects the neighborhood to the building more directly than when the building was used a sports arena and certainly more so then when the building was vacant. Publicly accessible gardens and market spaces surround the building while neighbors have access to some of the activities within without paying for a ticket. Second, the project attempts to repair the current disconnect between the public consumption of food and its production by making the agricultural process visible and by eliminating the distance between it and the community. Third, the building provides instruction and

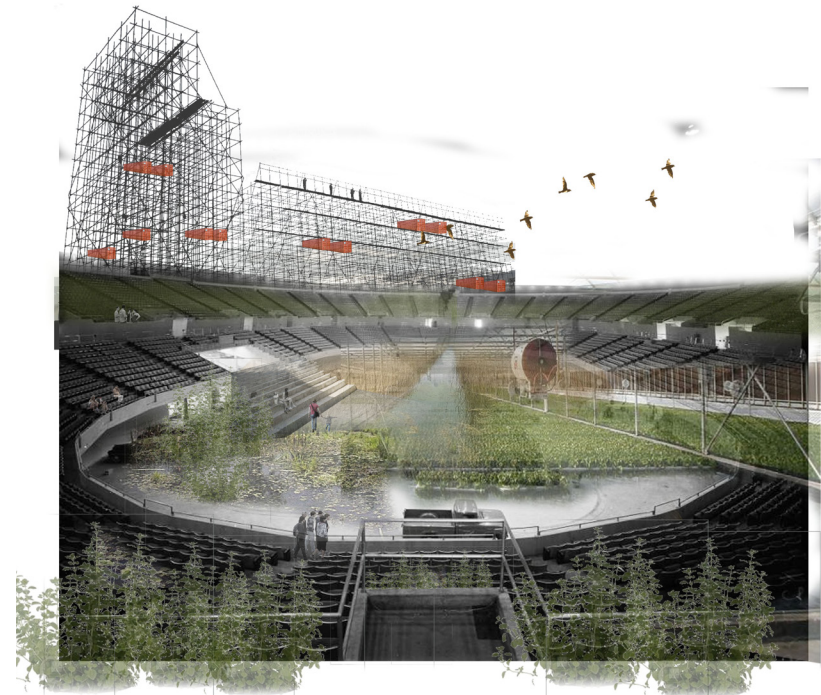


Figure 31: Initial concept perspective exploring the idea of re-appropriation of the arena bowl for urban fod production

education for the community regarding aquaponic agriculture, nutrition, health and well-being through additional spaces and experiences. These program elements include:

1. Aquaponic Food Production
 - a. Greenhouse space
 - b. Fish tanks (Aquaculture)
 - c. Composting Room/ Worm Bins (Vermaculture)
 - d. Mushroom Cultivation (Fungiculture)
2. Food Distribution
 - a. Harvesting
 - b. Composting
 - c. Fish Processing
 - d. Storage
3. Research Facilities
 - a. Labs
 - b. Meeting Rooms
 - c. Offices
4. Community Engagement
 - a. Auditorium
 - b. Classrooms
 - c. Teaching Kitchens
 - d. Food Market
 - e. Restaurant

COMMUNITY FOOD HUB

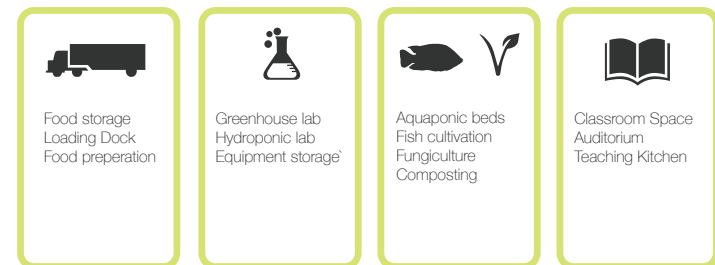
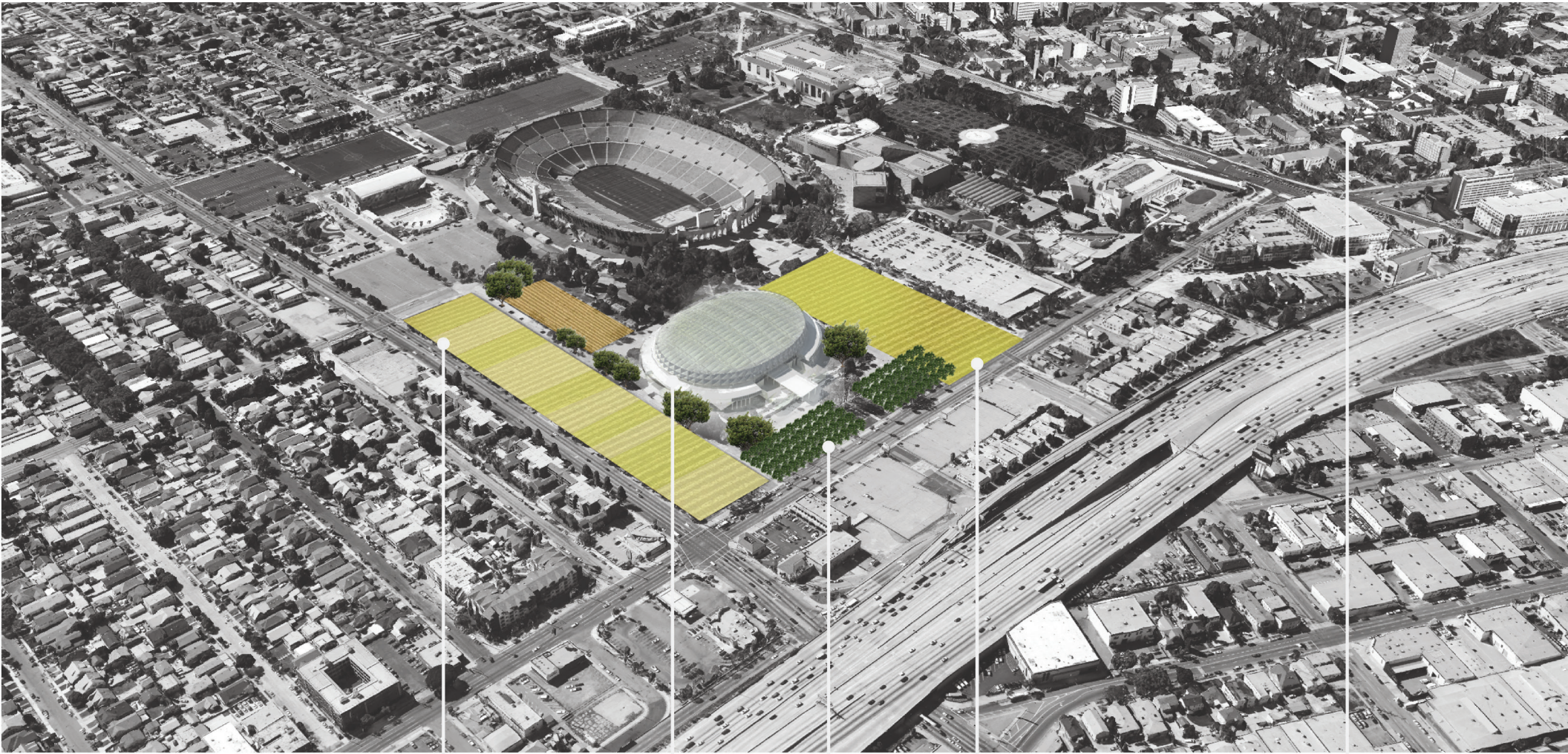


Figure 32: Food Hub Diagram



COMMUNITY
GARDENS

CULTIVATE LA
FOOD HUB

ORCHARDS

OPEN AIR
MARKET

USC

Figure 33: Site proposal

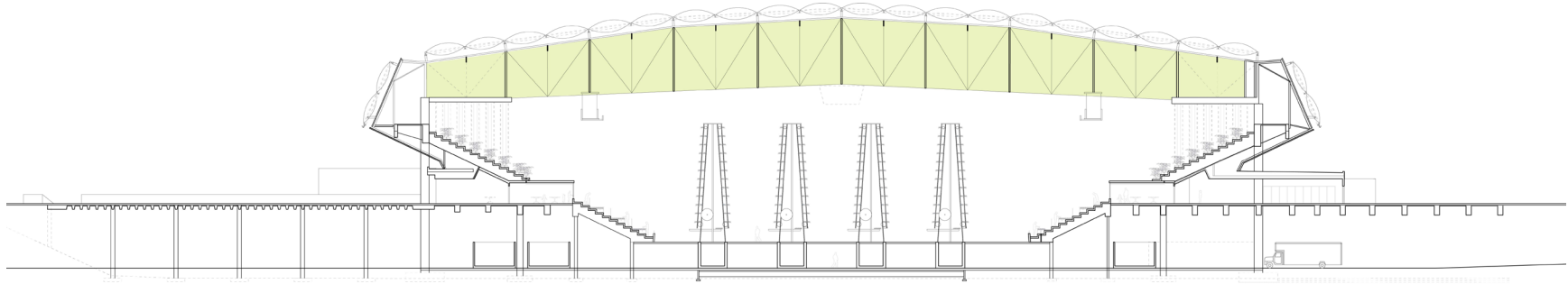


Figure 34: Section looking east-west, highlighting existing roof structure, which supports the new ETFE roof panels

Adaptation of the Existing Structure

The arena was originally built in 1959, and seated over 15,000 people. It was left relatively unchanged until 2001, when it underwent a seismic retrofit at a cost of nearly \$11 million. The retrofit brought the original concrete structure up to 21st century seismic standards with a series of steel braces frames. In order to incorporate the new framing system, portions of the arena floor were removed and replaced once the steel frames were fitted. The original facade or 'crown', which was comprised of small ceramic tiles, was replaced using an Exterior Insulation Finishing System (EIFSS) that was adhered directly over the tiles.

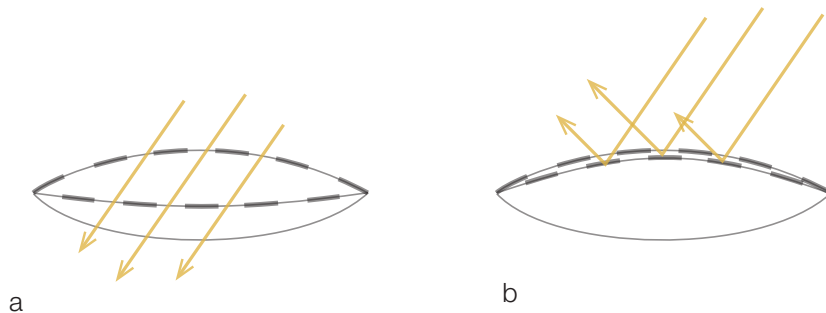


Figure 35: Sunlight penetration when ETFE pillowspanels (a)
Sunlight reflection when panels are closed (b)

ETFE

The proposed design retains the existing concrete structure and steel bracing, but removes the existing roof and facade. These elements are replaced with a new façade system of ETFE pillows. Ethylene tetrafluoroethylene, or ETFE for short, is a transparent membrane, first used in the 1970's as an envelope for greenhouses because of its high transmittance in the UV Spectrum.³⁸ The envelope consists of three layers of foil. These inflatables are arranged between new trusses that span the existing roof structure and transfers the loads to the columns and foundations. The ETFE

roof cushions span roughly 12.5 feet and are 25 feet long.

By varying the air pressure within the ETFE cavity the panels are moved closer or further apart. In doing so, the amount of daylight entering the building envelope is altered. The cushions can be individually adjusted to change the thermal conditions within the greenhouse. The ability to provide control both the amount of day light within and the thermal performance of the greenhouse is critical for effective plant growth. The expression of the ETFE pillows and their constantly changing configuration provides a dynamic and intriguing display for the surrounding community.

38. Kaltenbach, Frank. 2004. Translucent materials: glass, plastics, metals. Birkhäuser: Edition Detail. 70.

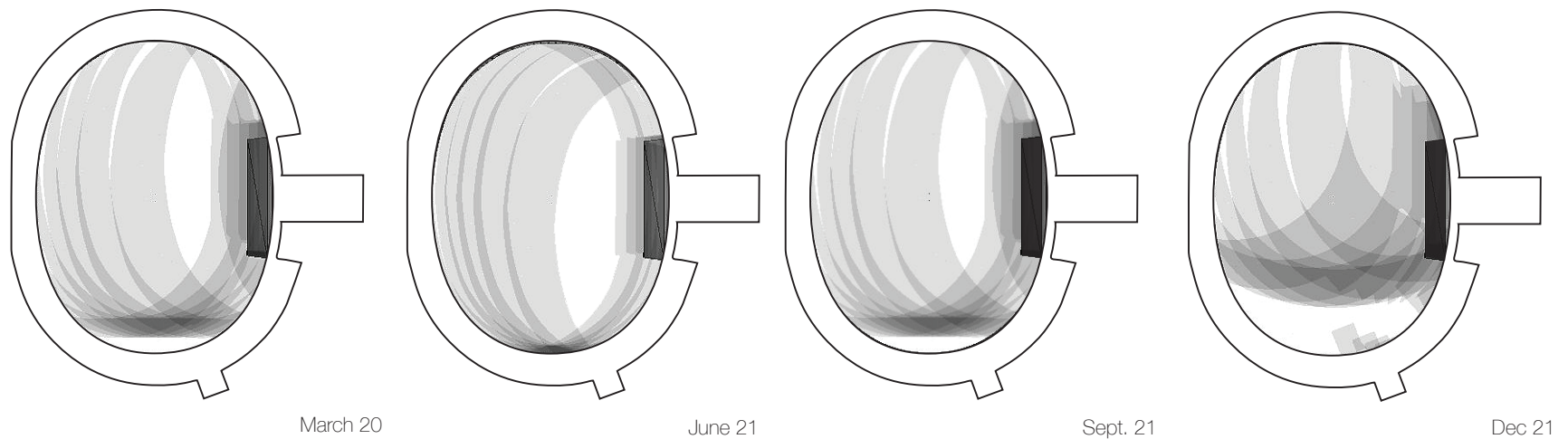


Figure 36: Shading diagrams

Shading

Following an extensive daylighting analysis it was determined that, in order to get enough light into the building for food production, the existing roof would be removed. Shading studies provided a thorough understanding of the lighting conditions within the arena bowl during both the summer and winter solstice and equinoxes. Because the existing facade tilted inwards, the most shading occurred near the top of the stadium as seen in the shading studies above.

The shading analysis provided important data regarding the treatment of the facade of the building. The dark rings along the exterior indicated that not enough light would be distributed at the top level. Replacing the facade with the ETFE system ensured both adequate and complete control of daylighting. In addition to helping determine the exterior envelope of the building, the shading studies were essential in determining the configuration of the planting as well.

Growing Systems

The bowl of the arena is used exclusively for food production.

The design of these spaces is generated from the configuration and operation of growing systems and the requirements of these systems. Shading simulations dictated the implementation of three different growing strategies within the space - the drip system (used for growing vine plants), the nutrient filtration system (used mostly for leafy greens), and the rotating growing towers.

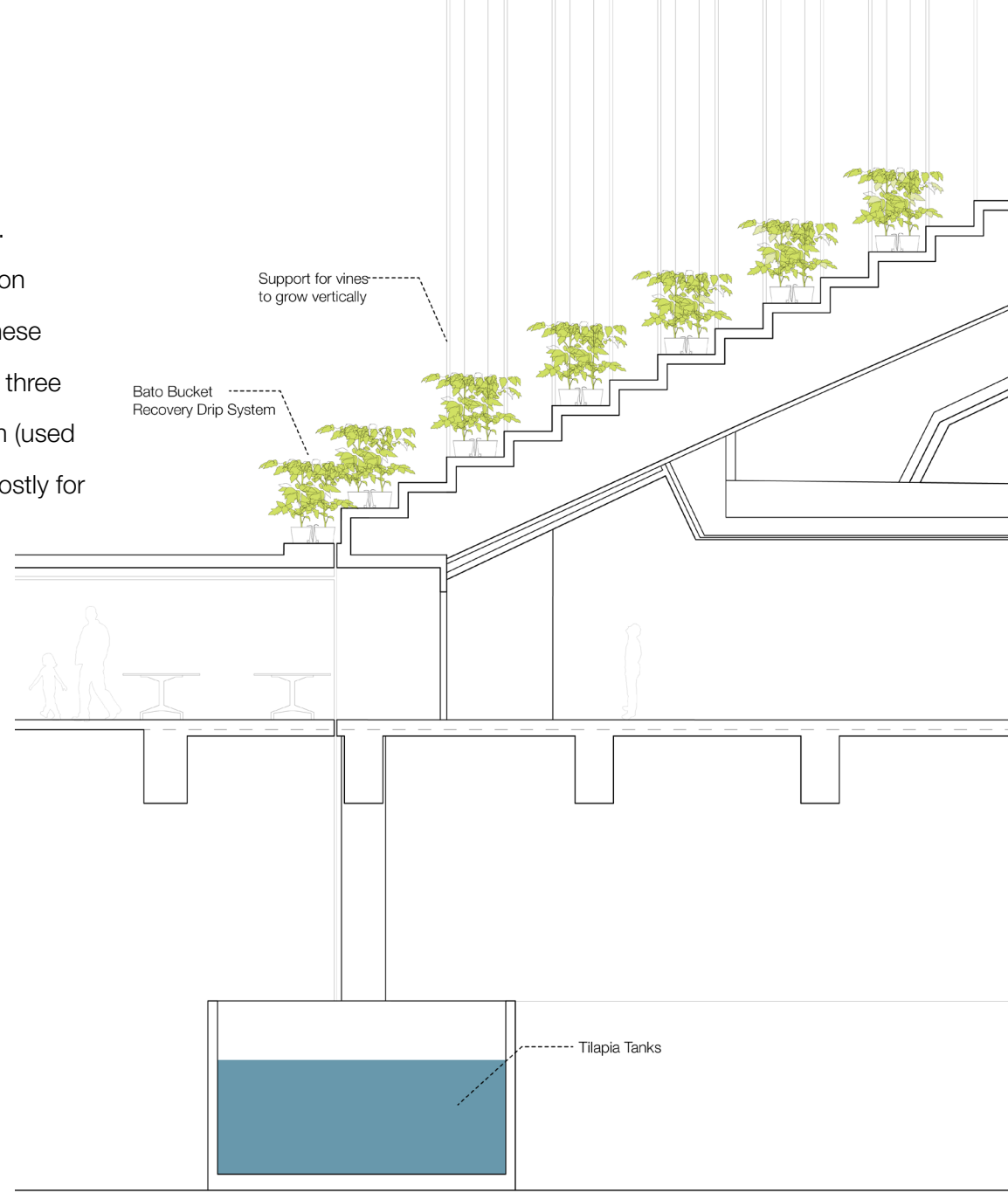


Figure 37: Drip System

NFT Channels

The nutrient filtration technique (NFT) employs a series of individual channels. These channels rely on gravity to move water between plant trays to fish tanks below. The terracing of the existing stadium seats provide an ideal condition for both the placement of the growing trays and the use of gravity to convey the water between trays and to the fish tanks below. The seating also allows for the plants to be staggered allowing for unobstructed sunlight.

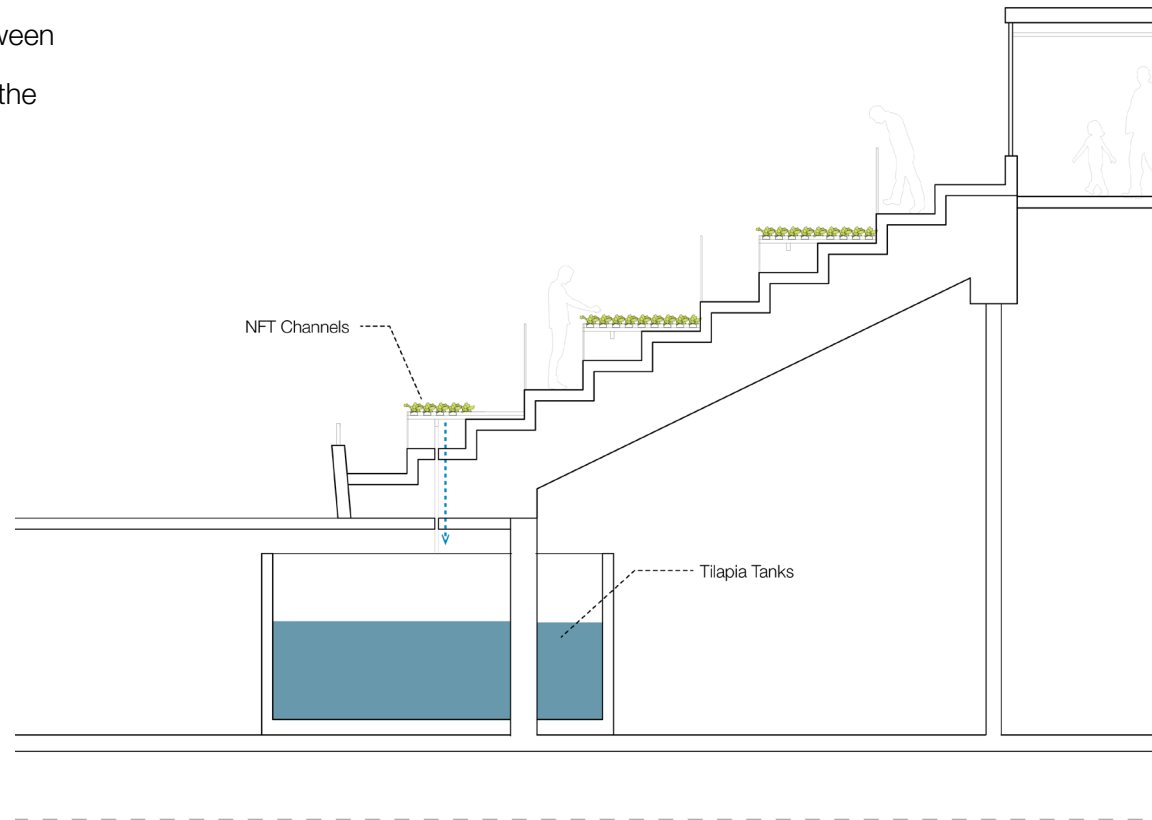


Figure 38: NFT Channels

Rotating Growing Towers

The third growing system employed is a grid of rotating growing towers. Cast-in place concrete fish tanks constructed on the arena floor provide a foundation and circulation system for this new system. These tanks house the tilapia, which are part of the aquaponic cycle. Spacing between the tanks is determined by the width of vehicles and service equipment needed for maintenance and harvesting and packing of produce. The walkway located 10 feet above the existing arena floor is used for servicing and harvesting the towers.

The towers are adapted from the Sky Greens Vertical Farm in Singapore. Sky Greens is the world's first low carbon hydraulic water-driven, tropical vegetable urban vertical farm in the world. These modular, tubular aluminum A-frame structures hold tiers of growing troughs which are rotated at 1mm per second or about 3 full cycles per day. The rotation system does not use electrical energy but rather is generated by a water pulley system which relies on flowing water and gravity to rotate the racks. This system allows for density on the ground floor.

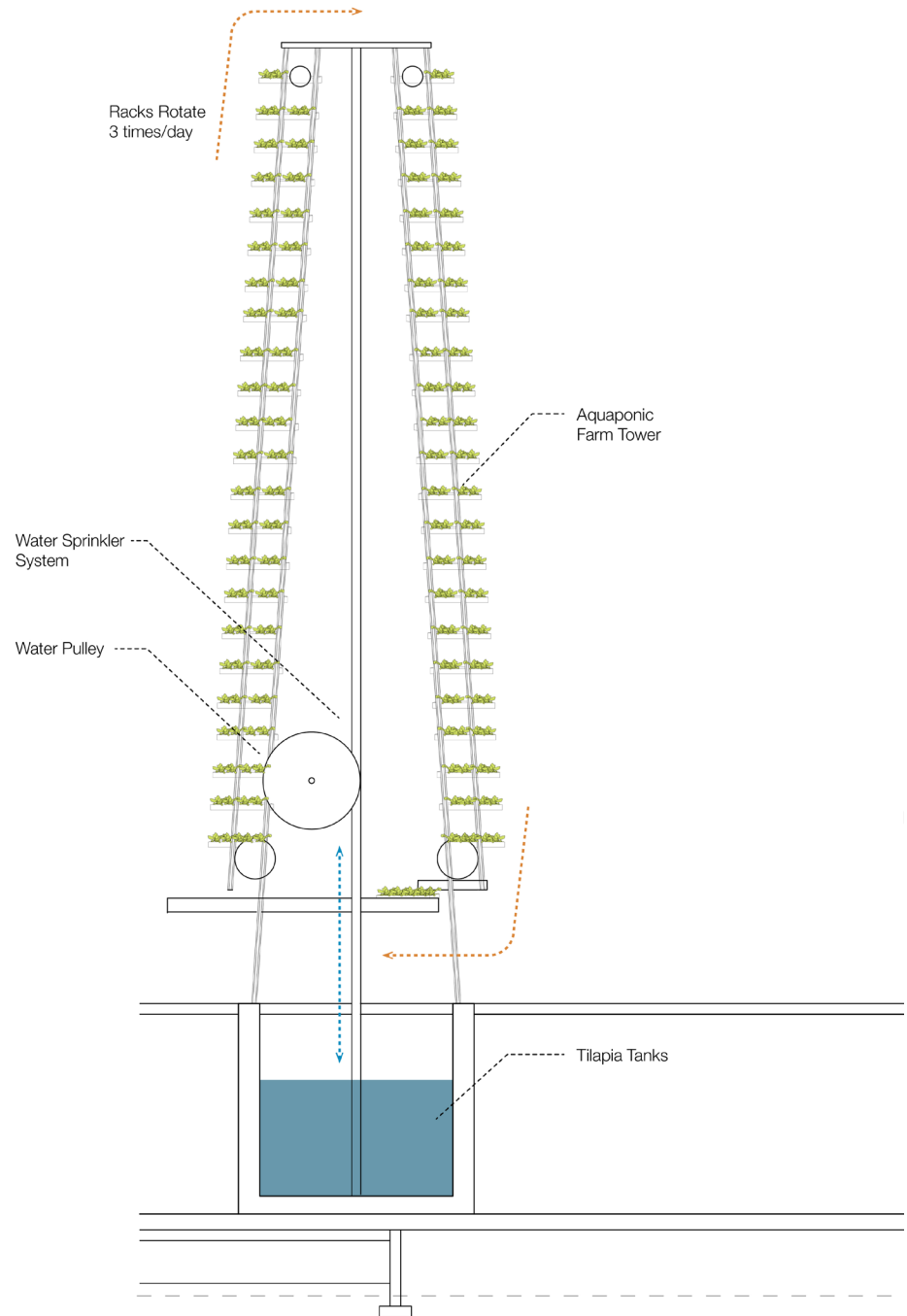


Figure 39: Rotating Growing Towers



Figure 40: View from walkway looking towards auditorium

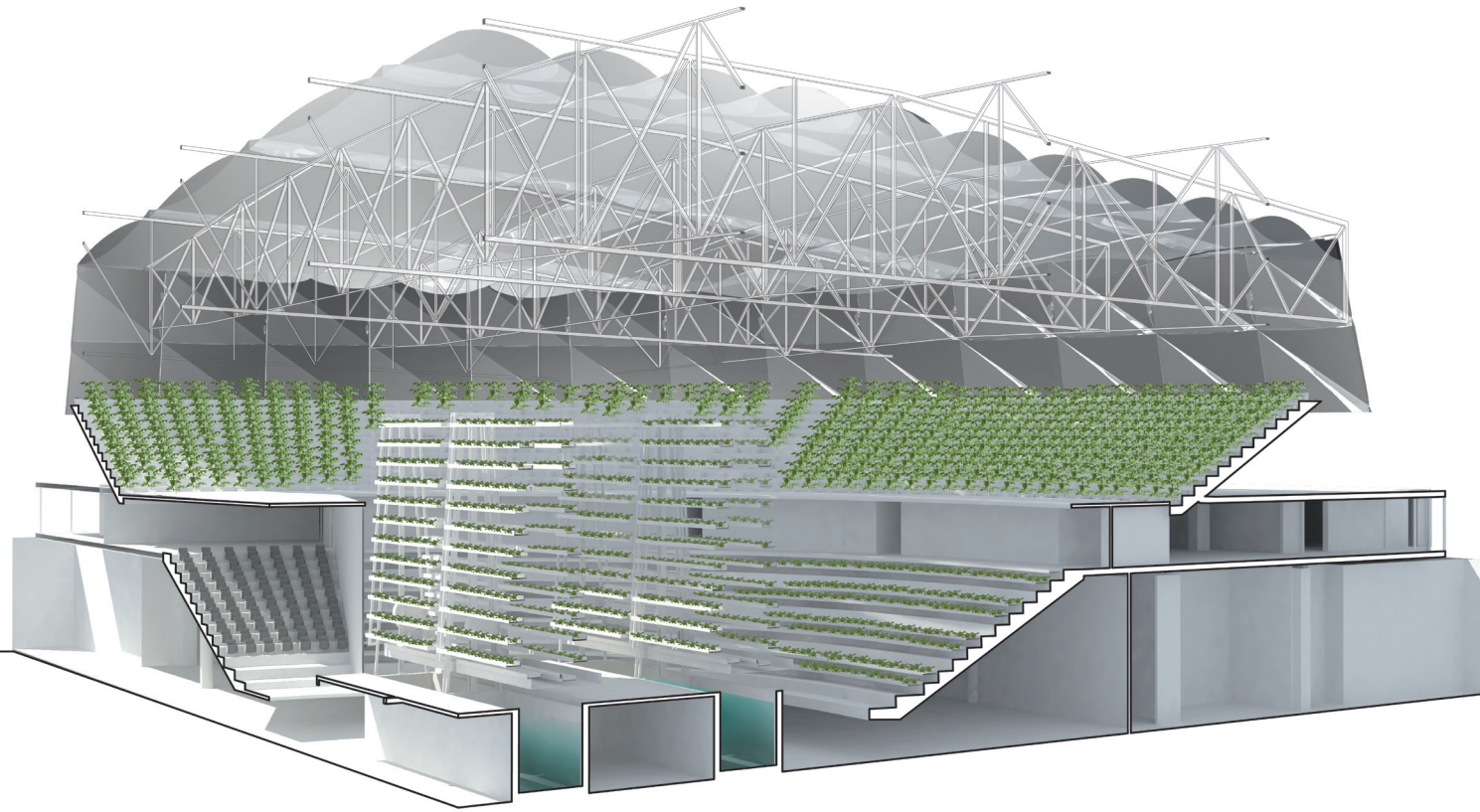


Figure 41: Section perspective illustrating the existing structure supporting the new ETFE roof.

Community Engagement

The site proposal seeks to engage the surrounding community in multiple ways and at multiple scales. As already described, the modifications to the building itself provide visual cues and enticement that a new and vibrant set of activities is taking place within the building.

The extensive grounds surrounding the building, much of which is currently used for surface parking, have been re-imagined as a place of agriculture, commerce, recreation and gathering. Orange trees are planted on the south-east end of the site, referring back to the site's history as agricultural park. The grove also creates a barrier from the freeway and main arterial streets to the east. Wrapping around the site, the south parking lot is converted into community gardens, which are open to the public. On the west, the sloped driveway to the lower level, remains in order to support the distribution facility. Finally, the northern part of the site is designed for social gatherings and weekly outdoor markets.

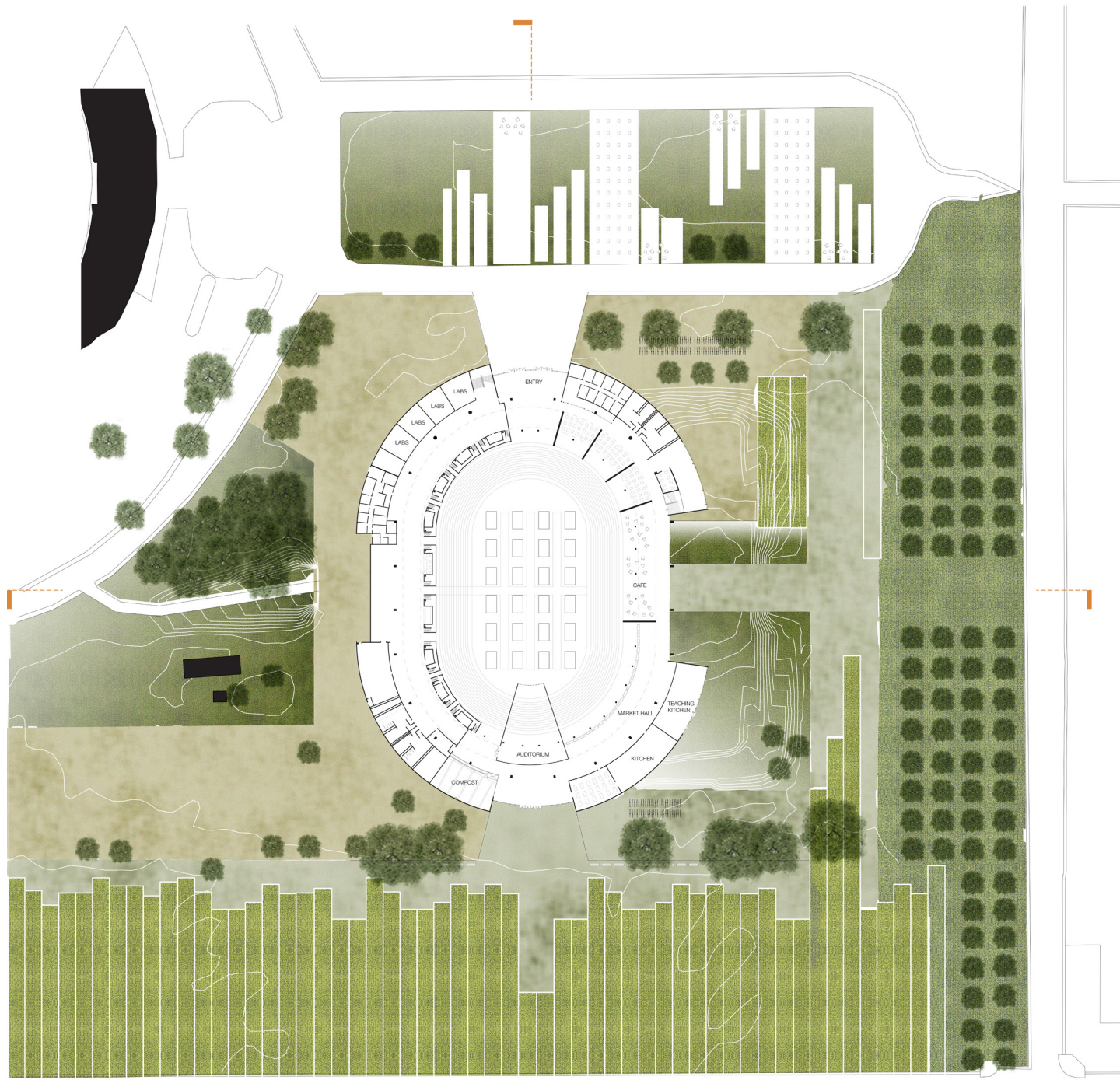


Figure 42: Site plan and ground floor plan

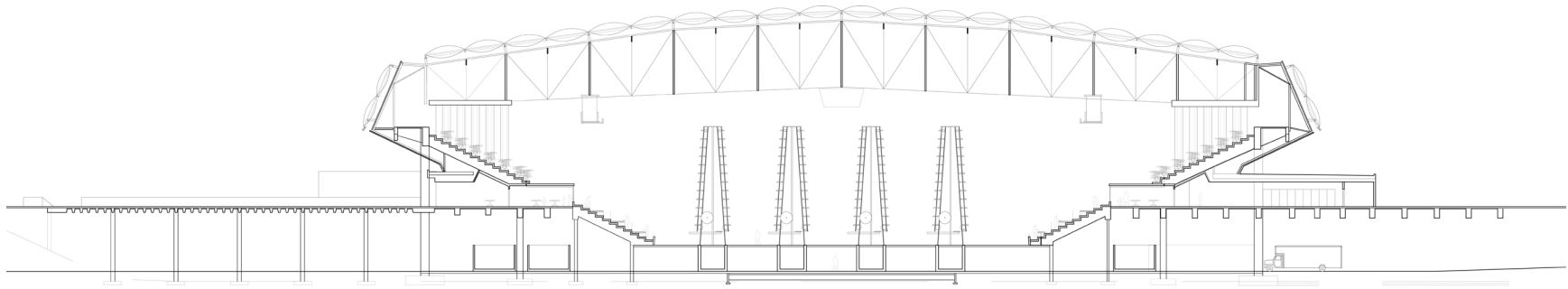


Figure 43: Transverse section

Ground Floor

The main community entrance is on the east side of the building, which is easily accessible from Figueroa Street or Exposition park. The entry includes cafe seating with a view into the arena bowl and growing towers. After entering the building, the public can either go left or right along the path of the concourse. To the left, the concourse is converted into a permanent market hall. Past the market hall is a large auditorium space and a lobby with a view down to the composting room. The public can either walk back through or exit the south doors and walk out to the community gardens.

To the right of the entrance is a community kitchen, classrooms for learning about growing methods and administration spaces. Throughout the concourse where stairs have been taken out there are framed views of the converted arena bowl.

The west wing of the building is designated for aquaponic research and development.

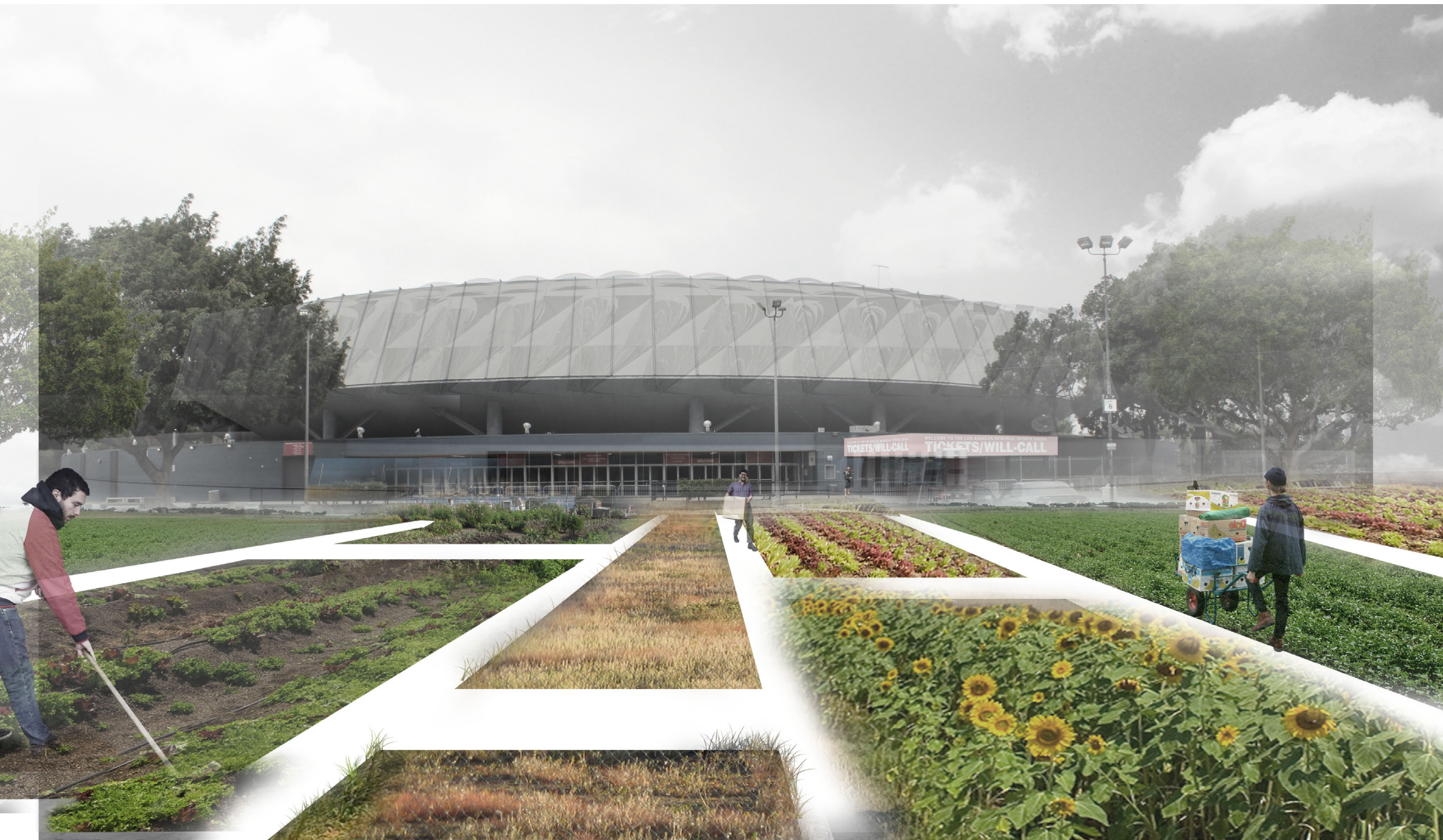
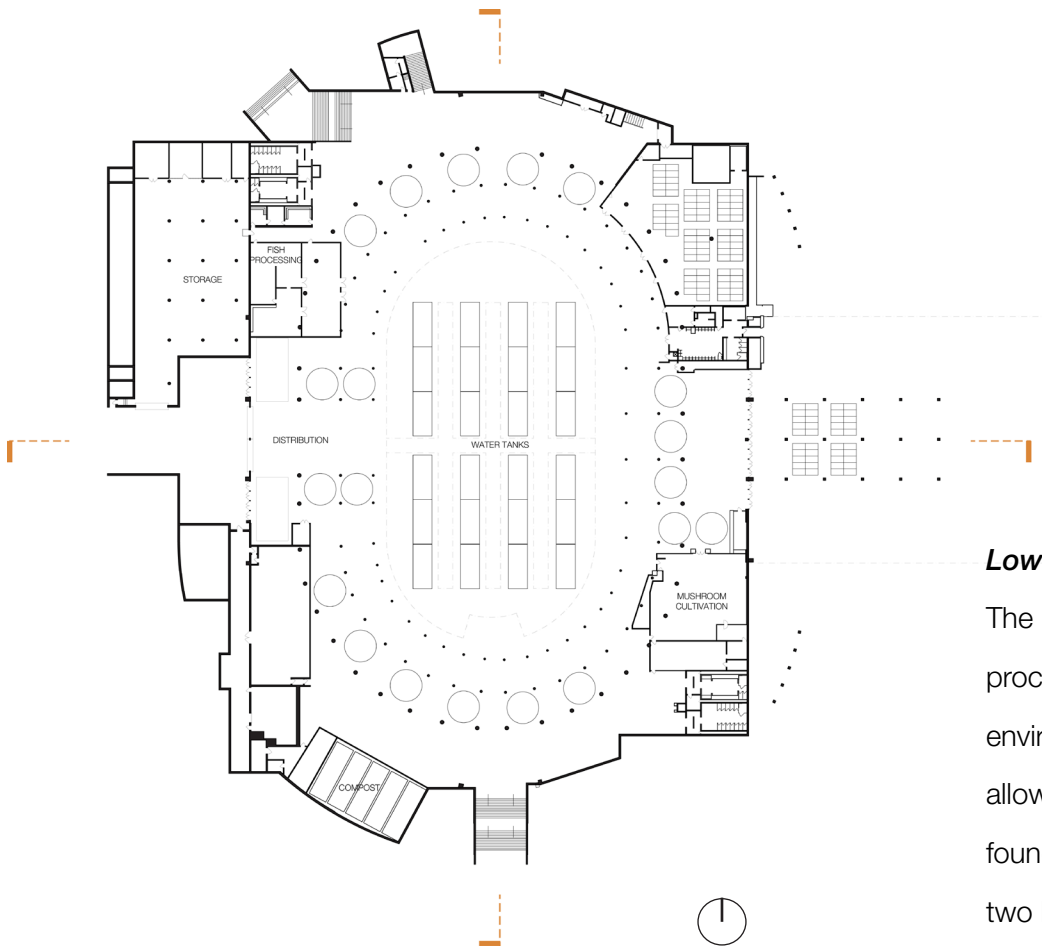


Figure 44: View from community gardens towards south entry



Figure 45: View from auditorium



Lower Level

The lower level of the hub is designated for food production, processing and distribution. In order to create a controlled environment, only designated staff or chaperoned tours are allowed to be in this area. The arena floor holds the fish tanks and foundations for the growing towers. More fish tanks, serving the two levels of terraced growing, are radially placed between the existing concrete columns. Finally, along the outer edges of the building are spaces for processing fish, cultivating mushrooms and composting.

Figure 46: Lower level floor plan

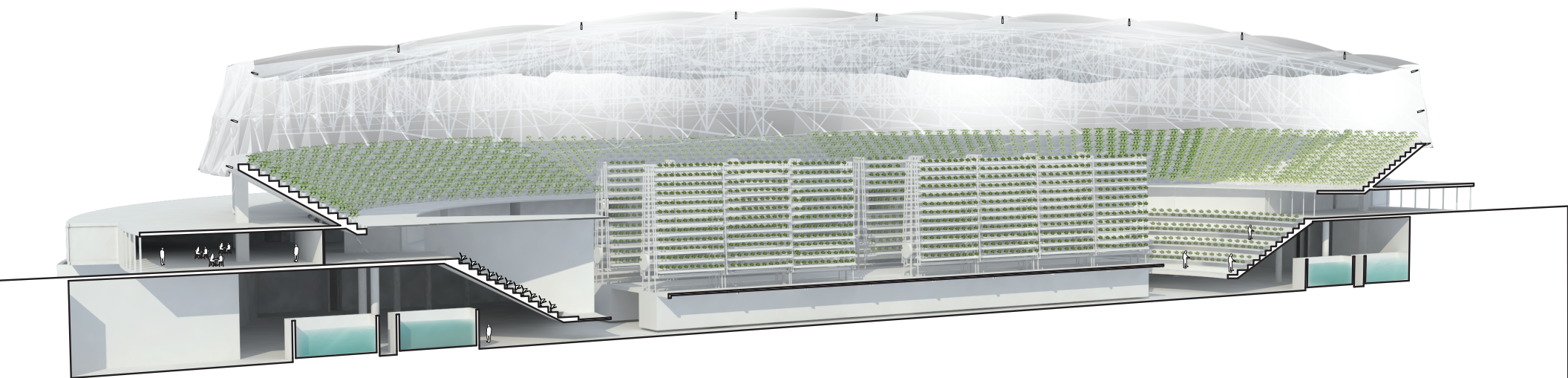


Figure 47: North-south section perspective through auditorium and growing space

CONCLUSION

The South Los Angeles Community Food Hub strives to solve problems at multiple scales. On the local scale, the adaptation of an existing arena transforms what was once a building of global significance into a community based center. The food hub remains a landmark while simultaneously reinvigorating the community. Not only does it provide for the community, but it also connects food to the consumers. On a broader scale, the adaptation of the arena becomes a prototype for future urban agriculture models. There are hundreds of arenas in the country and around the globe that are currently struggling with premature obsolescence. Given that these arenas were built to house similar functions with regulating dimensions it seems feasible that once one successful model is demonstrated it would be easy to replicate the process.

The design for the arena adaptation is a direct response to the needs of an aquaponics food production facility. While the production of food was the driving force, this also had to be a space that attracted the community to come, to learn, and to get involved in the process. The new ETFE roof and façade system communicates to the community the transformation of the arena.

At night the LED grow lights illuminate the panels creating a new landmark for South Los Angeles.

Further development of this proposal would explore the continued integration of the community-based portions of the project. With more time the design could be developed to further reflect the community-oriented portion of the adaptation. Another expansion of this thesis would be its integration into a broader food network for all of South Los Angeles through a phasing approach. Ways in which this may happen include populating the site designated as community gardens with additional green houses.

The intention of this proposal was to question the current methods of designing stadiums as a single use space. Billions of dollars are spent to build these huge structures, which are primarily used for entertainment purposes before they are no longer suitable. While this is a proposal for adaptive re-use, it is equally important to consider the initial design and how these structures might be better designed for adaptability throughout the building's lifespan.

APPENDIX Additional Site Photos





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26. Diagram of drip irrigation system
27. Tomatoes grown hydroponically <http://www.agratech.com/cms/upload/gallery/images/6/Todd%20McPhail%20Hydroponic%20Tomato%20Agra%20Tech%20Solar%20Light.jpg>
28. Bato bucket hydroponic growing <https://www.flickr.com/photos/dulcelife/2048886048/in/photolist-4BvQeK-feMbrm-dYnoiw-dYgGax-4845rw-9AdW71-a9EUkF-a8y48z-a7EA1W-dbyyHY-a9ERTz-ddc-MxT-ddcNez/>
29. Aquaponic systems diagram
30. Diagram of mushroom/plant CO₂ exchange
31. Initial concept perspective of arena bowl
32. Coomunity Food Hub Diagram
33. Site Proposal
34. Longitudinal section through Food Hub
35. Diagram of light penetration through inflated ETFE panels
36. Shading studies of existing arena with roof removed
37. Diagram of drip irrigation growing system
38. Diagram of nutrient filtration technique growing system
39. Diagram of growing towers
40. View from walkway looking South towards the community Auditorium
41. Section perspective illustrating roof structure and growing systems
42. Site plan and ground floor plan of Food Hub
43. Transverse section through Food Hub
44. View from community gardens towards south entrance
45. Looking into the auditorium space
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47. North south section perspective