UNIVERSITY OF CINCINNATI

Date: May 15, 2009

I, Bridget Hall, hereby submit this original work as part of the requirements for the degree of:
Master
in Architecture

It is entitled:
ReTHINK New Orleans: Bridging the Gap Between Disciplines to Create a VISION for the Community

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ReTHINK New Orleans:
Bridging the Gap Between Disciplines to Create a VISION for the Community

A thesis submitted to the Division of Research and Advanced Studies
of the University of Cincinnati

In partial fulfillment of the requirements for the degree of

Master of Architecture

In the School of Architecture and Interior Design of the
College of Design, Architecture, Art & Planning
Spring 2009

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Bachelor of Science in Architectural Engineering
Tennessee State University, Spring 2005

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I abstract

It is time to rethink the rebuilding of New Orleans by evaluating the city, using practices of multiple disciplines in order to create lasting solutions. The city of New Orleans experienced the United State’s worst natural disaster to date in the wake of hurricane Katrina in August of 2005. New Orleans was devastated. The simple difference between this major American city and so many other hurricane ravished cities in history is that New Orleans has not recovered more than four years later. While plenty of suggestions, Master plans and ideas have been proposed, minimal large scale efforts have come to fruition. Before making rash decisions about what should be built, one must take into account the breakdown in infrastructure that caused the city to be crippled. The very levee and pump system that maintains the city has been its detriment. Along with global warming, sea level rise and the continuous loss of buffering wetlands fighting against the city’s survival; one can argue that it is time to make holistic decisions. Projecting flood levels and the ability of the levee and canal system to perform in the future is equally as important as analyzing the urban fabric and recommending new architectural innovations. To date, the majority of rebuilding in New Orleans has been from grassroots efforts in small pockets of the communities without a collective agenda. It is critical that the rebuilding process takes into account that the city of New Orleans must be rebuilt with enduring answers, not temporary fixes.
II Acknowledgements

This has been an amazing journey. I humbly thank everyone who pushed me to get to this point. The road has been rough, yet nothing that which does not kill you can only make you stronger. I know that being the first is a dream realized because of the many shoulders I stand on. My family and friends have been more wonderful than I can describe. With their help, I dared to hope and trust that this was my destiny. I could not begin to thank all the people who made me who I am enough and I am honored to have been blessed with so many great people in my life who have believed in me. Most people will never experience half the honest support I have come to cherish. I vow to never take it for granted and pay it forward at every opportunity. Thank you!
I Abstract.3
II Acknowledgements.5
III Table of Contents.7
IV Vision
   A. Introduction | Design Process.9
   B. History | Culture.13
V Literature Review
   A. Lessons from Chicago.18
   B. Gustav was no Katrina, but Next Time.20
VI Infrastructure
   A. Threats.22
   B. What Can Be.28
   C. What the World is Doing.32
VII Urban Fabric
   A. Existing Conditions of the Upper Ninth Ward.37
   B. Site Analysis.43
      a. ReTHINK Housing.43
      b. ReTHINK Buffer.46
      c. ReTHINK Neighborhood.48
   C. Precedents.51
VIII Architecture
   A. History | Modern Additions.53
   B. Precedent.56
IX Design Intent
   A. Proposed Housing Development.59
   B. Reflection | Conclusion.63
X Bibliography.64
IV Vision

A. Introduction | Design Process

“Do you know what it means to miss New Orleans?”

Creating a new vision for New Orleans is a large and necessary task. Visiting the city of New Orleans is an experience. It is an experience that can leave a lasting impression on the visitor. Few tourists that stroll through the French Quarter and down Canal Street know the pain still suffered daily in the neighborhoods of New Orleans since hurricane Katrina. The residents are like that of no other city; holding onto their history and culture is a badge of honor. Seemingly most apparent, through everything that has happened to the residents, the human spirit is remarkably palpable in the city of New Orleans.

The vision for the city of New Orleans is based on workable principles, starting with exploring lasting solutions that inspire change in the way the city of New Orleans grows into the future. Secondly, it is important to build on the existing community, considering the richness that made it successful before the hurricane, all while applying practices from various disciplines in order to explore a more holistic approach to design. The vision is sensitive to the needs of the current user as well as the future user. Lastly, it is important to provide spaces for the community to convene and begin to become whole again.

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It is important to build a vision for the city of New Orleans that will take into account the many factors that make the city great while serving the needs of the residents. Inspiration for this thesis came from all facets of New Orleans, melding its unique mélange of architecture, ornate detailing, wild colorful facades, and festive identity. The rich history and culture of New Orleans are like no other major American city. The preservation and retention of that which makes New Orleans great is paramount. Considerations must be made to project future growth and provide sustainable solutions without neglecting the residents’ interests.

The choice to study New Orleans was a simple one. It is nearly impossible to visit the city and leave without being overwhelmed with the feeling of wanting to do more for those that are still hurting almost four years after Hurricane Katrina. “As we were reminded that everything we take for granted is not always granted to everybody…what it would be like to live in New Orleans, or Biloxi or Gulf Port, what it would be like to see the place you grew up lying in ruin, what it would be like to see your childhood neighborhood underwater, to see your home and your possessions and everything you’ve worked for washed away without warning or reason.”2 The disparity of New Orleans has the power to leave a lasting impression of what is truly worth fighting for, regardless of how large the battle may seem.

The design process for the thesis began with research and ideas that lead to informed decisions about what to develop for New Orleans. The design process evolved from using different disciplines to create a holistic design. Starting with infrastructure, urban design and architecture merging and swirling together as ideas are formed, created and melded into a thesis. The research of the infrastructure

Diagram of design process IV

begins to raise questions of the urban design, which begins to raise issues of the architecture. Each discipline motivates exploration of the next.

Hurricanes often leave destruction in their wake. It was paramount that this thesis be succinct and palatable in order to help understand what the city of New Orleans can do to survive in the future. An understanding, as well as a knowledgeable consideration of different disciplines, is very important to exploring solutions for the city of New Orleans.

Quantum City’s diagram below shows how different disciplines can interact. It is important to note that these disciplines appear to be all moving away from each other. For this thesis, it is imperative that the end result be a cohesive effort of techniques and practices from different disciplines.
What any well functioning community needs is a system that fuels progress. To aid in New Orleans’ success, there should be advocates working on its behalf, self sufficiency of residents and cultural vitality. Without a strong emphasis on all three factors, there will always be a disconnect in the community’s continued success.

The redesign of New Orleans is not simply about creating more buildings, or housing, or social services. The physical being of the city is far less important than all of the many factors that make up a city. It is naive to approach the problems resulting from Hurricane Katrina from just any one angle. For that reason, a simple architectural approach to design is insensitive. The redesign must be looked at for the many reasons that have brought the city to its current predicament. Only then can responsible recommendations be made.
The many cultures that immigrated to New Orleans and thrived there are the reason the city is so unique. Each culture brought its own way of life with it, be it building, cooking, or dancing. Present day New Orleans pays homage to each country that has ruled the city, preserved in the historic architecture while shining through the hearts of the residents.

Explorer Jean-Baptiste Le Moyne, Sieur de Bienville founded Nouvell-Orléans in 1717, choosing to settle in the bend of the Mississippi River. Bienvelle’s chief engineer advised him not to settle there because of the area’s flood potential, but Jean-Baptiste insisted. From the beginning of its founding, flooding was a problem for the city now known as New Orleans. The initial site was selected because it was the highest point in the area, but when the street grid was first laid out in the French quarter, drainage ditches were laid out to try to keep water out. In 1722, the first levee, (from the French word lever, “to raise”)3 began being built. For years after, residents build their own levees in hopes of keeping their homes and communities dry.

The treaty of Paris in 1763 turned New Orleans over to Spanish rule, and it was turned back over to the French in 1800. All the while Cajuns were immigrating into Louisiana. In 1803 New Orleans was sold to the United States with the Louisiana Purchase. The location was optimum for trading,

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with the Mississippi River being the link between Canada and the upper and lower America’s.

New Orleans is no stranger to disastrous flooding. In 1849 there was a levee breach that flooded the city for over a month. The response to continuous flooding was to build levees on either side of the Mississippi River in hopes of preventing future floods. In 1920, Albert Baldwin Wood invented the screw pump and changed drainage technology for New Orleans. It was then that the city was able to grow north towards Lake Pontchartrain. Refer to the end of this chapter for a time line of New Orleans’ history and development.

In New Orleans, slaves were often given the opportunity to buy their freedom and become “Gens de Couleur Libres,” the free people of color, unlike most other southern cities. The presence of many free African Americans changed the dynamic of the city greatly. African Americans were afforded the possibility to form lasting communities. The oldest surviving African American community is nestled in the heart of New Orleans, Treme. In Treme free people of color, including Creoles owned property and built a lasting legacy. The strong African American heritage is felt throughout many New Orleans neighborhood. The neighborhoods hardest hit by hurricane Katrina were predominately African American communities, including the Upper Ninth Ward. It is pertinent that the long legacy of thriving African American communities be allowed to thrive in New Orleans well into the future.

It was in New Orleans that jazz was born, at a time when Americans felt that African Americans were not capable of creating greatness. Simply enough, Buddy Bolden developed the bold new sound that made people
dance. The ability of the music to bring people together is what many believe helped jazz succeed in its early stages. African American, Creole and white musicians were coming together in hopes of creating a new sound. Jazz remains at the heart of New Orleans culture, which is another reason New Orleans is still such a unique city.

In August of 2005, Hurricane Katrina ripped through the city of New Orleans. While it seemed that the hurricane destroyed much of the city, it is a little known fact that New Orleans was a ticking time bomb of failing infrastructure. Katrina’s massive storm surge simply set the stage to test the infrastructure of the city. Multiple failures of the levee and pump system seemed to happen all at the same time and showed that New Orleans failed that test miserably.

Almost four years after Katrina, the city is slowly trying to recover, but the rebuilding has been a long process. New Orleans does not have the luxury of simply rebuilding without considering future threats. Allowances must be made for the very real threats of global warming, the loss of wetlands and failing infrastructure, as described in Chapter VI Infrastructure A. Threats. While change is inevitable, the unique urban fabric of the city of New Orleans must be observed. Designing a plan without dissecting the existing conditions is not the solution. Developing a multi disciplinary vision for a better New Orleans is the first step. Then the tools of different disciplines, the research available, and the findings of yesterday to build hope for tomorrow must be utilized.
History timeline of New Orleans

1841 - St. Augustine becomes Louisiana's first segregated church.
1851 - Louisiana secedes from Union.
1861 - St. Louis Cathedral is built.
1868 - French Market's Bazaar market opens, designed by African American Architect, Joseph Abalang.
1870 - Louisiana is re-admitted to the union.
1878 - With pump stations in place, the city begins to build on lower ground.
1903 - City begins its ground breaking drainage system.
1904 - The first recorded jazz funeral takes place.
1905 - Buddy Bolden, the creator of jazz and his band.
1912 - Louisiana state flag.
1913 - Allen Baldwing invents the wood screw pump, used to reduce flooding.
1927 - New Orleans expands the canal system to over 150 miles.
1936 - Bennett Carrie Spillway opens to prevent flooding in New Orleans.
1949 - Hurricane Katrina strikes New Orleans, hard, flooding neighborhoods.
2005 - Hurricane Katrina changes everything.

The destruction remains.

History timeline of New Orleans
V Literature Review

A. Lessons from Chicago

Austin Williams’ article from Spiked-Online.com, “Lessons from Chicago”, highlights what the city of New Orleans can take from the great Chicago Fire. Williams draws the parallel between the rebirth of Chicago and the potential for growth in New Orleans after hurricane Katrina. He believed that if Chicago could be raised, then there was no reason New Orleans could not be raised as well.

“Chicago was built on reclaimed swampland and much of the city is only a few feet above Lake Michigan’s water surface. Getting fed up of constant flooding, inadequate sanitation and the threat of disease, something had to be done. In the mid-1850s, therefore, the city authorities introduced legislation to overcome the problem - that the streets be lifted. Over the next 20 years, the city was lifted up in the air, out of harm’s way, by between one and five metres.”4 In the midst of the city’s improvement, the Chicago fire hit.

In the wake of the fire, the city of Chicago moved to legislate the use of steel fire protection. With this new unheard of push in architecture along with the elevator, the skyscraper was born. The city took the disaster of the fire and used it to rebuild, bigger and better than before. Chicago began to develop and grow into the heavily populated, architectural marvel that is known and loved today.

4 Williams, Austin. Lessons from Chicago (Spiked-Online.com, September 12, 2005). 1.
Williams hopes to inspire the city of New Orleans to rebuild smarter. He encourages New Orleans to look at rebuilding of the city of Chicago, and learn from Chicago in an effort to make New Orleans better, instead of merely rebuilding the same flawed infrastructure. Williams believes that New Orleans can rebuild to survive the next major hurricane. Williams believes that New Orleans’ city leaders should push for more cutting edge engineering and architecture that will change the profession as we know it. To rebuild with a short term plan for the city would be naive. A long term plan for survival if implemented, would be more beneficial to this city. To build a better New Orleans now would be more expensive today. Much in the way of lifecycle costs, the investment will pay off. The city runs the risk of paying much more when they do not plan ahead, whether in the form of money, assets, time or residents’ lives.
V Literature Review

B. Gustav was no Katrina, but Next Time

In “Gustav was no Katrina, but Next Time,” John Schwartz explores the status of New Orleans infrastructure when faced with its first big challenge after Katrina: Hurricane Gustav. The Army Corps of Engineers had been working to improve New Orleans’ levee and canal system to meet a 100-year flood level by 2011. The city can only hold its breath as each hurricane makes landfall in the mean time. While the infrastructure is not up to the desired 100 year level yet, it is stronger than when Hurricane Katrina struck New Orleans.

Schwartz points out that New Orleans was very fortunate that hurricane Gustav weakened before making landfall and moved west of the city. The hurricane was described as a strong category four that had the potential to become a category five storm by the National Hurricane Center. “From the triumphant tone of some public statements and news coverage after Gustav passed through, it would be easy to think that the upgraded hurricane protection system in New Orleans had passed it first big test and that it’s all bon temps (French for good-time5) from here. But complacency is as big a threat as wind and storm surge to a city that still has a long way to go- especially in light of rising oceans and a subsiding landscape.”6 The people of New Orleans would be very naïve to think because the city survived hurricane Gustav, they are safe from the threat of another Katrina sized catastrophe.

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There were many close calls that led the Army Corps to remind New Orleans natives to be cautious in the future. Some worry that the extreme warnings made by Mayor Ray Negan were blown out of proportion, because the city fared well during Hurricane Gustav. Residents evacuated in high numbers. Schwartz cautions residents to “stay nervous.”

Until the levee system is completed there is no reason for the people of New Orleans to relax unnecessarily. “That’s the balancing process that anyone engages in, whether they are Nebraskans factoring in tornadoes, Californians weighing earthquakes or New Yorkers considering another terrorist attack or crane collapse. Nervousness – not panic, but good healthy jitters – should be part of anyone’s complex calculus of risk and reward, head hart and wallet.” New Orleans is no different. Perhaps the city’s approach was far too laid back three years ago. Now they have seen the destruction and should understand what Mother Nature is capable of. People can return to New Orleans, but they can not relax.

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7 Schwartz 1.
8 Schwartz 1.
VI Infrastructure

A. Threats

There are many threats to the city of New Orleans that outweigh that of hurricanes. The destruction left in a hurricane’s wake is easy to see. Threats to the coastline are gradual and far more subtle. Even still, in the event of a hurricane, the extent of devastation to the coastline is revealed.

Someday the entire coastline of Louisiana could collapse. The Mississippi River Delta lost more than 1,000 square miles of land from 1930 to 1990. The eroding of the land is at an alarming rate and has accelerated from years past. Fifty years ago 10 miles of coastline were lost per year compared to 40 miles a year by the 1970s. There are restoration efforts being explored in hopes of avoiding a collapse of the ecosystem. Plans such as Coast 2050, an effort on the part of the local, state and federal governments

10 Wallace Roberts & Todd, LLC.
are geared towards restoring barrier islands and preserving grass bed populations. Even as they restore, the damage done is too great to protect New Orleans from strong hurricanes.

Hurricanes are getting stronger and reaching the city faster. With the raise in sea temperatures the intensity of hurricanes has increased. Hurricanes are not new to New Orleans; they are merely becoming more damaging. As early as 1852, even before storms were being named by the United States weather service, category three hurricanes were striking in the region. In recent years, the threat of category four and five hurricanes have become realized. Far more important, New Orleans’ vulnerability has been comprehended.

The very location of New Orleans makes it a challenge. The city rests in the crook of the Mississippi River with Lake Pontchartrain to its north. To the south and east of New Orleans are the wetlands that used to serve as a buffer between the city and the Gulf of Mexico. The development of the wetlands derived from the natural distribution of the

[Map: New Orleans estimated loss of wetlands]
[Map: Hurricanes greater than a category three within 100 miles of New Orleans]
[Map: Infrastructure threats map]
Mississippi river. As the river flowed down into Louisiana every year, the soil and sediment would remain behind after the annual floods receded. Over time, plants took root and the wetlands were born. These wetlands serve as a buffer, protecting the inner city from hurricanes. A storm loses speed and intensity for each mile it crosses over the wetlands. Hurricane Katrina’s effects on New Orleans were thought to be so devastating because of the deterioration of the wetlands and the loss of the protection that they previously served.

The design of the levees and canals of New Orleans and the way they developed the city into a great metropolis were once heralded as one of the great engineering accomplishments of the 1920’s after the screw pump was invented. The screw pump allowed engineers to constantly keep the city dry in a way that had not been possible before. In the case of New Orleans, the city was able to develop through engineering. The seawall that frames Lake Pontchartrain and the pump stations that keep water levels manageable are as much the success of the city as the European charm of the French Quarter. Unfortunately the system that helped New
Orleans to flourish is out of date and is no longer serving the city’s needs efficiently.

What was far more detrimental to the city of New Orleans than hurricane Katrina was the destruction that resulted from the pump station and levee failures. Flooding was as high as 10 feet in some areas for weeks. The infrastructure doomed the city. Once the infrastructure failed, the city shut down and sealed its’ fate. Without having access, there was no way for the city to begin recovering until the water had receded.

“The resulting destruction (of hurricane Katrina) had been predicted, and flood prevention plans drawn up. But these were systematically ignored by the federal government, which cut the Army Corps of Engineers’ budget, year after year. Meanwhile, petroleum companies were given tax breaks and allowed to cut canals throughout southeast Louisiana.”11 Why the city felt they could escape the reality of their precarious situation is a mystery. Few people who understood the severity of the infrastructure of New Orleans

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were surprised by the destruction of hurricane Katrina.

The residents paid the ultimate price. They were not allowed to return to the city until floodwaters receded to a safe level. With no power over the situation and faced with a mandatory evacuation before the storm, residents returned to sheer devastation. By that time, homes could have been submerged for weeks without relief.

The damage done to a building sitting in water for two weeks was great. Even worse than one that was simply hit by a hurricane. There was no relief for the flood waters after the pumps failed. With no access in and out of the city, there was no way to repair the pumps. The city had to simply wait for the floods to diminish before even starting the process of getting people safely back to their homes. In some low lying areas the wait took weeks, with flooding as
much as 10 feet in residential neighborhoods. In that time adjoined with the heat that New Orleans knows well, the moisture had caused homes to mold throughout. People returned to buildings that were no longer structurally sound and hazardous to their health.

The city of New Orleans proposed protection plan after hurricane Katrina leaves much to be desired. New pumps were put in place along Lake Pontchartrain and the existing levees were repaired as needed. There was a proposal to close the Industrial Canal at Lake Pontchartrain and the Mississippi River Gulf Outlet (MRGO). During Hurricane Katrina, the Industrial Canal had three major levee breaches resulting from Lake Pontchartrain and MRGO’s direct route from the Gulf. The storm surge off of Lake Pontchartrain has long been a problem for the city. This initiative may not be enough to adequately handle the next hurricane. Neither of the waterways have been closed to date.
VI Infrastructure

B. What Can Be

The city has taken the stance that Hurricane Katrina destroyed flood walls and levees in New Orleans, so they should be rebuilt. To look at what the walls are doing to the land and not merely assume that the walls are the best option to protect the residents is more important.

There are four typical interventions that can be done as the sea levels rise. New Orleans has chosen to protect as its’ strategy, but the effects of that protection do not come without a cost. Not only will sea walls potentially not protect the city in the case of a hurricane, they cause the shoreline to erode. As the sea level rises and the wall fails, a bigger and better wall must be built, causing the shore to erode even more and the cycle continues.

To retreat can only be an option for so long. The sea level will continue to rise. Closer to the shore line in neighboring parishes of Louisiana, there have been moves
made to accommodate sea level rise by building on stilts or raise buildings on pilings. Assimilation is one adaptation that New Orleans has yet to try. In the Netherlands, they deal with similar coastal erosion issues and flooding and have long sense made provisions to accept the inevitability of Mother Nature taking back the sea. The Netherlands are designing in harmony with water and building for the future as further described in Chapter VI. Infrastructure. C. What the World is Doing.

New Orleans faces the challenge of being at or below sea level. Much of the city is six feet below sea level. Being so low below sea level raises the question, whether the lowest points in the city should even be rebuilt or could the land be put to better uses. It can be seen as irresponsible on the part of the city of New Orleans to rebuild in areas that are low lying, if an extreme hurricane puts residents’ as well as rescuers’ lives in danger.
Lake Pontchartrain sits at sea level, but the Mississippi’s water level is ten feet higher. The city remains above water by levees placed at each side and throughout. In some areas, the land has been built up to be higher than sea level, but a lot of the city is well below sea level by as much as ten feet. In the case of storm surge, the secondary system is made up of pumps. The pumps cannot handle extreme amounts of water for extended periods of time and often fail. In which case, there is nowhere for the water to go once it has entered the bowl. In the case of pump system failure, the city must wait out the flooding.

Extreme potential conditions were explored for the city of New Orleans and have been challenged. In one scenario, the entire city of New Orleans in section from the Mississippi River to Lake Pontchartrain is filled with water to sea level. This would mean that the existing structures in many areas would be underwater. Eliminating much of the habitable land of the city. In another scenario, the entire site is filled to sea level with land. The Mississippi River still remains 10 feet above the filled land. These cases bring up arguments of what happens to residents who own land that must compromise. There is little possibility that the situation be handled fairly. The scale of this section is too large to make any such a decision about the city and helps to explain the need to come down to a smaller scale to investigate the city’s needs.

The corner of Law and Desire Streets was investigated to see what would happen using each of the four strategies of adaptation. Even before the hurricane, the area was in need of repair. Hurricane Katrina left the area with many blighted buildings and little rebuilding has been done.
A different concept of retreat is being explored, with the area going back to nature. Letting the uninhabitable homes deteriorate at their leisure and allow the plants to overgrow. In an effort to accommodate, the new structures built in the area could be built on stilts to avoid flooding.

The area currently is adjacent to a canal, yet the idea of placing a wall on top of it can be explored. The area sustained seven feet of water for weeks after the hurricane; it is possible that having a wall to protect it may have kept the water out. Lastly, the new community could be built with floating foundations that are tethered to the lot that will allow homes to float out flooding in extreme cases.

Photos of post Katrina New Orleans bear a striking resemblance to the proposed floating cities in the Netherlands. One can make the conclusion that this is a glimpse of what may be in store for New Orleans if the coast continues to rise. Instead of causing alarm, the images can inspire initiative steps to adapt buildings to assimilate with the water. By implementing floatable foundations that could better deal with future threats. New Orleans’ has the opportunity to become an even more iconic American city in the wake of Hurricane Katrina.
C. What the World is Doing

Flooding is not a new concept to various parts of the world. New Orleans can learn from other countries’ examples to address issues of flooding. From London to the Netherlands, to St. Petersburg or Venice, these cities have faced similar concerns of finding ways to keep residents safe from rising waters.

The Army Corps of Engineers has been proposing gates and barriers for the City of New Orleans since the late 1960’s, but has had trouble garnering support to fund the projects. What is alarming about New Orleans compared to other areas around the world that are prone to flooding is that the height of peak sea surge had to get to 28 feet during Hurricane Katrina for them to begin looking erecting barriers\(^1\), unlike the 15 feet that prompted the Netherlands and Britain to do the same.

Major flooding in 1953 in Thames Estuary opened the eyes of the UK government and led them to create a flood defense scheme for the city of London. The process was slow, but by 1965 the Greater London Council was formed and began to progress for a flood gate design. The Thames Barrier was constructed in 1984 and cost 75\% more than first hoped. The cost included smaller barriers that aid in the defenses downstream.

The Barrier spans across the Thames River with four main gates that have been dug down into the river bed.

Hours before high water is anticipated, the Barrier is closed. In the case of a storm, the gates rotate to block the surge and protect the surrounding area until the waters recede. The Barrier works perfectly for the occasional storm surge. The fear is at a time of extreme storm surge over 10-12 feet the gates will not perform as intended.

To date the city of London is still fighting against the effects of global warming, violent storms and a rising mean-sea level. The Barrier was designed to handle a mean sea level rise up to 0.22 meters\(^\text{13}\). Researchers believe that by the year 2030, the barrier will no longer be effective given a rise of 0.31 meters. At the very worst case scenario the Barrier could be insignificant by the year 2015. Just like New Orleans, London is looking to find new methods of staying dry.

1953 brought heavy flooding to the Netherlands as well as London. The first line of defense was to create river dikes that harmed the landscape. By 1990, the damage caused by the dikes caused and investigation to find a less destructive way to protect the area. Before moving forward, the Dutch looked back in the history of the river to see what had been done in the past. From 1000-1800, settlers between the Rhine and Maas rivers erected levies to deflect flood water at right angles. They later became known as side dikes.

In later centuries, dikes were built to create foreland that helped to hold storm water for later use in the summer. Dikes helped prevent flooding annually, but was only a temporary solution. Much like New Orleans, the creation of these channels created other problems. Year after year the sediment from the river raised the foreland level and increased the river height. The water level rose and caused breaches that resulted in even larger flooding. The Dutch learned that they had to continue the system of dikes by raising and widening year after year.

In an effort to move forward with a solution into the middle of the 21st Century, the Oosterschelde Storm Barrier was built at a cost of 2.5 billion euros in 1986. The idea is that a project of this scale would decrease the chance of flood to less than once every 4,000 years. The total length is 3 kilometers, yet it allows for nature to live alongside it. The water temperature is optimal for birds, fish and mussels, as well as anemones and starfish.

One important lesson New Orleans can learn from the Netherlands is the value of variety. After the flood of 1953, the Dutch not only raised the height of the existing dikes, but created a system of dams, structures and sea walls to maintain their defenses. Delta Works was created to maintain the series of dams & barriers in the area that costs an estimated $500 billion a year. Yes, Delta Works is expensive, but the insurance it grants to the residents is priceless. Tourism, industry and agriculture all responded of the system’s completion with an economic boost for the local economy.

15 Fischetti 2.
The city of St. Petersburg has had flooding problems from the very beginning. Founded in a low lying area that has seen 270 major floods over the years. In 1824, the flooding reached 13.5 feet above the river level. The area is plagued by the low-pressure air masses from the Atlantic. This air creates “long waves” that cause surges at the Neva River. St. Petersburg is home to countless Russian treasures. Annual flooding puts them at risk.

Work began on a 25 kilometer dam to protect the city in 1979. The barrier consists of rock and earth embankments, navigation channels, bridges and a traffic tunnels. The government faced financial hardships trying to complete the barrier. Loosing funding for 10 years before getting back underway in 2003.

St. Petersburg’s solution for flooding is particularly helpful because of the similar issues of large bodies of water. As Lake Pontchartrain is to New Orleans, so is Neva Bay to St. Petersburg. Likewise, the Gulf of Finland poses a threat of storm surge just as the Gulf of Mexico does to New Orleans. A flood barrier the size of the one erected to protect St. Petersburg, is a likely solution for minimizing the threat to New Orleans.

Venice is made up of small islands nestled in a lagoon. The city has been fighting floods for hundreds of years, going as far as setting up catwalks for the people to walk over to get around above the water. Venice is sinking, the sea level is rising making the normal way of life difficult in Venice. The once thriving city’s population began shrinking and the first floor of most buildings has been deserted after being found too difficult to maintain.

The solution is a series of gates built along the lagoon floor that will rise in the case of high tides to protect the city. The gates are lowered after the tides subside. Many fear that the gates could pose a threat to the ecosystem by separating the lagoon surrounding Venice from the Adriatic Sea as well as become insignificant in less than fifty years given the rate of sea level rise to date.

In 2003, the Louisiana Coast Area plan was developed and included a gate in the Mississippi river that would allow sediment into the wetlands in hopes of rebuilding New Orleans natural barrier. Many fear that the sheer impact of Hurricane Katrina and Rita that came shortly after changed the landscape enough to make the current plans that were in the works obsolete. The majority of the plans for barriers in the city are for the river, but none have been developed to prevent storm surge from attacking the city from Lake Pontchartrain.

The city of New Orleans’ problem is complex given the variety of threats to its existence. Land along the delta tends compacts over time, causing it to sink. Worldwide, coastal areas are suffering from sinkage due to the removal of natural gas and oil. The Army Corps of Engineers did damage to the ecosystem by dredging lanes for ships, and building levees along the Mississippi river. Channels were then dug for pipe lands, and ships brought about wave erosion that only them larger. Combine that with the threat of the ocean rising from one to three feet in the next 100 years. Cities like New York and Shanghai fear they may have to armor themselves with walls and pumps at worst case scenario.

17 Fischetti 1.
18 Fischetti 3.
VII Urban Fabric

A. Existing Conditions of the Upper Ninth Ward

The urban fabric is a city’s built environment. In the case of New Orleans, it is important to take into account what is existing and integrate that with the new design. There was considerable damage in the wake of Hurricane Katrina, but there are many homes that can, and are being salvaged. The design intent of this thesis is to integrate new construction with what is existing in order to gradually evolve the city.

The explored site of the thesis is in the city’s district seven. This area includes the Desire, Florida, St. Roch-St. Claude and Bywater Mariony neighborhoods, but is more affectionately referred to as the Upper Ninth Ward.

To consider future growth in addition to look into pre-Katrina data is quite important. The city is less than 50% post-Katrina occupied, yet it is projected to grow with time. The implementation of a strong vision is much more important to future growth of the city. One of the biggest immediate needs is for affordable housing in the neighborhoods which

[Context map of New Orleans & focus area]
were destroyed and now suffering severe neglect.

The existing conditions were explored in the area, taking into account the land use, existing facilities and access to transportation. The industrial canal runs along the site and the location of the levee breaches after hurricane Katrina were identified to stress the importance of the vulnerability of the area. Three sites at a micro scale were selected for further study in Chapter VII Urban Fabric B. Site Analysis. The sites are analyzed at the street scale for a more thorough investigation.

The housing that is currently being built in the area is through grassroots movements. Musician’s Village is a Habitat for Humanity development that is almost complete. Nestled in the Upper Ninth Ward, Musician’s Village has more than done its part to inspire the entire city. The vibrant homes built by volunteers from all over the country are a part of the first development to be built merely six months
after hurricane Katrina hit the city. There are over seventy multicolored homes that serve as a beacon of hope as people in the neighborhood returned. To date, over 90 additional surrounding sites have been acquired in the area around Musician’s Village and are being built throughout the Upper Ninth Ward by Habitat in an effort to revitalize the area, one home owner at a time.

The neighborhood was analyzed to take into consideration the residents’ needs. The type of transportation most frequently used is the car, the second being bus. Interestingly enough, in a city well known for its streetcar system, less than 1% of the residents in this area use it regularly. This could be the result of little or no streetcar access to this particular neighborhood.

The greatest concern for residents is to find a place to live. A survey of residents both displaced and those that had returned after Katrina was conducted by the city of New Orleans for the Neighborhood Rebuilding Plan (NOLARP). Residents were asked to state their immediate problems and biggest fears for returning to the city. Clearing of debris, rebuilding homes, finding money to pay for rebuilding their homes and their families were most important to the residents. Residents said nothing of sustainability of the place called home. No one can blame them, after what the residents of New Orleans have been through. Residents should be commended for tenacity. Recommendations can be made to take the problems and add in additional considerations that may not have been recognized by the residents.

The results of the NOLARP survey can be translated into a hierarchy of needs. Taking a look at all the problems the residents deemed important and adding in issues that

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have been identified by taking a look at the community, the blue words represent the community’s prioritization and the green indicates the addition of the thesis’ vision.

The unified New Orleans plan has been proposed for the Upper Ninth Ward. While their intentions may be good, they have addressed the issues of rebuilding as an immediate fix to the problem. There were no concessions to address the future of the city. The city is choosing to ignore what is inevitable.

The plan stresses the idea of new urbanism to help the “new” New Orleans to be in sync with the historic buildings that remain. Yet there is a focus of the plan that consists of superblocks and new high density housing that wipes out entire existing areas where many salvageable homes currently stand. A Master Plan is a useful tool when it addresses the needs of the people. New Orleans’ natives are not being heard if this is the response to the many charrettes hosted by the city in addition to the survey taken. “We have a surplus of plans, many of them quite sound and longstanding and unrealized. What we do not have is a language, much less a political culture that adequately addresses the complexity of our position(s), our predicament(s), and our pain without response to euphemism.”

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Sexton 121.
VII Urban Fabric

B. Site Analysis

In order to investigate the Upper Ninth Ward, three micro sites were chosen with very different conditions to take on the various issues of the area in an efficient and manageable way. The three main issues, considered relevant to the area were: how to infill single family residential areas; how to address neglected housing projects, and what could happen to buffer the areas where residential homes met the industrial zone at the industrial canal. The first of the three sites was the corner of Law and Desire Streets, where a retail corridor meets a single and double family area. The second was the corner of Polland Avenue and Miro Street, where the industrial buffer meets a residential block. The third site was at the midpoint of the Florida Housing Project.

1. ReTHINK Housing

The first site is in the Desire neighborhood, which is 70% owner occupied. The neighborhood is comprised mostly of single family dwellings and is predominately zoned for single and two family units. There is also a retail corridor
with many businesses that did not survive the hurricane. A bus line runs down Desire Street, giving the neighborhood much needed access to public transportation. There are many hurricane ravished homes that have been left to deteriorate. A major point of concern for the residents is what happens when some people have rebuilt, but other houses in the neighborhood sit dilapidated. There are opportunities for infill throughout the Desire community.

At the corner of Law and Desire Streets sits the historic Club Desire. A nightclub built in the early 1940’s whose stage was graced by many of New Orleans finest jazz musicians, such as Fats Domino, Louis Armstrong & Billie Holiday. Club Desire has long since been left for ruins, but to the community the building is an old reminder of the once prominence of the Desire neighborhood. The area consists of many single family residents who live in a variety of shotgun homes in very close proximity. In some instances, there is more than one home on a lot where family members have added a home behind their own for a loved one to live in.

The diagram above demonstrates the level of flooding in the neighborhood after Hurricane Katrina, compared to the finished floor of the homes and the new Federal Emergency Management Agency (FEMA) regulations set forth after the hurricane. To only rebuild to the new standards when there is a five feet difference in the potential water level is a waste
of time, effort, and money when inevitably another Katrina-sized disaster could hit New Orleans.

Building a community with enduring solutions without losing the character of the neighborhood is imperative. In the Desire site, the goal for rebuilding is to rethink housing. Floatable living can be explored in the area. Most homes in the area were salvaged and have a low finished floor elevation. Building new homes 10 feet in the air alongside homes that are barely 15 feet tall would be insensitive. Raising the finished floor level of new homes has the potential to isolate the homes from the street and close knit community. A way to remove that possibility is to build homes low to the ground that can float in case of catastrophic flooding.

The sense of community is palpable at the first site. The area near the corner of Law and Desire was among the first to begin individual homeowner rebuilding after Hurricane Katrina and one of the most thriving residential areas to date in the city of New Orleans. One can not walk down Desire Street without seeing children playing in their yards or neighborhoods convening on their porch. It is a place where everyone waves to each other and complete strangers are greeted as friends.
In between the Industrial Canal and the Upper Ninth Ward neighborhood is an industrial area that thrived before Hurricane Katrina. The import industry that the canals where dug for lies abandoned all along the canal. Many businesses have not recovered from the hurricane and the results are large empty lots. At the corner of Polland Avenue and Miro Street is a triangular piece of land that has potential to act as a buffer for the residential area. With access to public transportation and major road way, this site is a great example to explore options of what can be done to address the issues of buffering between different zones.

The existing conditions diagram shows the area zoned industrial and residential. Polland Avenue is a major vehicular street with access to public transportation at Miro Street. The area in between has the potential for medium scale buildings that could act as a buffer for the two conflicting zones. By rethinking the buffer, this site could
use a building as a hard edge to address missing pieces along the length of the industrial zone. Because the homes are two stories or less, the intermediate building should step up to meet the height of the industrial buildings.
The Florida housing projects was under new construction when Hurricane Katrina hit the city of New Orleans. The foundations for additional homes were being built on the west side of the existing housing project. After the hurricane, the city of New Orleans abandoned the existing Florida projects, barring former residents from returning to get what was salvageable of their belongings. The city of New Orleans boarded up the homes and demolished the hard hit community center. All plans for new construction were halted because they did not comply with new FEMA regulations.

The entire site is zoned multifamily, with Alvar Street being the major street in and out of the development. The initial potential diagram explored the option of creating large scale mixed use buildings across the street to act as anchors where the community center used to be, and infilling the remainder of the site with smaller residential units.
What the initial site analysis did not include is the Florida Canal to the north of the development. While it is often at a nonthreatening water level most of the time, in the case of Hurricane Katrina, its connection to the Gulf of Mexico caused a storm surge and high flood water to destroy the homes in the area. While the design proposal could work, it is a timid solution at best.

After analyzing the site at the micro level, further design exploration of the site shows the opportunity for the introduction of a new typology could be used in various sites throughout New Orleans. The site was further analyzed at a larger scale of three by two blocks. By rethinking the neighborhood, one can take into consideration what is important. Zooming out, one can see the threat of the canal changes the way this neighborhood should live.

The old housing project was comprised of two to three story units with large metal stair cases that lead to each upper unit. It was inefficient with the metal stairs that were uninspiring. A whole new development is to be built, therefore providing the opportunity to create a raised housing typology for New Orleans. The value of raising the finished floor of the project can now be explored on a new level.

The idea is for this new housing typology to continue to aid in the potential life cycle of the site. By elevating the entire living situation, the framework is created for the development to serve dual roles. Upper and lower movement...
living levels work well in its early use and as already in place post-flood living. It will be important to stress the program in the upper and lower levels to prove the relevance of exploring this neighborhood. This community has laid forth its desires for rebuilding in Chapter VII. Urban Fabric A. Existing of Upper Ninth Ward, it is now necessary to develop the uses from their hierarchy of needs. A figure ground study of the existing streets, shows areas that were designated for parking for the homes to come. The design intent is to keep the existing streets and build from what is already there. The concept is further laid out in Chapter IX. Design Intent.
The Master plan for Dordrecht, Holland serves as a precedent for the design process for the thesis. The plan was developed by Barker and Coutts Architects (BACA) and took a holistic approach to the planning of the area. BACA took an industrial Brownfield and created a sustainable environment to address the issues of flooding in the future.

What is most impressive is the variety of techniques explored and recommended for the site. This variety adds to the richness of the plan. Cities are not made up of any one solution. BACA’s attention to that detail shows sensitivity to the overall scheme of the design.

BACA’s East Tilbury project takes a look at an area outside of London where flooding is an ongoing problem. The area most known for flooding has been sprinkled with refuge buildings for residents to seek shelter in case of
emergencies. Further inland are to be multifamily projects of a large scale that do not have living spaces at the first floor level. In the interior of the city the smaller single family dwellings, are to be built in an effort to protect them from flood waters.

BACA took a look at the existing fabric and responded to its needs as well as predicting future flood threats. By combining many techniques, it not only addresses the needs of the environment but serves a variety of needs and covers more ground than if there were only one initiative. By looking at a transect of the area, and addressing the various issues of the sight, a more holistic solution can be found.
VIII Architecture

A. Historic | Modern Additions

The architectural characteristics in the city of New Orleans are deeply saturated by a plethora of cultures. Any new additions to the community should reflect those cultures while serving the residents that have been misplaced. A design approach to the neighborhood can serve to aid the city of New Orleans in addressing the issues of the community that they have seemingly neglected in previous master plans.

What resulted from the mélange of cultures was not only a unique urban fabric, but a unique stock of architecture. It is not uncommon to see a Creole Cottage beside a Porte-cochere townhouse next to a Queen Anne Style home or a Shotgun Home. With each new wave of immigrants to the area came a different style of building that is still present today.

The porte cochere townhouse dates back to the 1800’s and is similar to the Creole townhouse in that they both have rear courtyards, first floor shops and second floor dwellings. What is wonderful about the porte cochere townhouse is the courtyard that has over time morphed into a gathering place for families and friends. The technique of responding to cultural nuisances must be implemented into the design.

The double shotgun house, served to maximize lots in...
New Orleans’ neighborhoods. With mirrored spaces sharing a common wall, it is very common throughout the ninth ward. It is not uncommon for generations of families to live in each side, continuing the social pattern so important to the people of New Orleans.

The upper ninth ward has a variety of homes, mostly comprised of single and double shotgun houses. The personal style that each resident adds is what makes a New Orleans neighborhood unique. From the ornate details to the vibrant colors, the tradition going in the design is important to keep.

Throughout New Orleans modern buildings are nestled amongst the classic architecture the city is known for. Some buildings are better received than others. The buildings done with the scale of the neighborhood in mind, appear to be the most successful. The Lower Ninth Ward was a neighborhood of New Orleans also hit hard by hurricane Katrina. The Make it Right Project offered an opportunity for architects around the world to design homes for new residents. The project is fueled by donations from around the world in an effort to bring a movement of modern architecture to New Orleans.

The Make it Right (MIR) Project as a whole has little cohesion. An effort should have been made to give the homes larger setbacks so that they would not loom over the streets. While the majority of the project has been placed in an area where no homes survived the hurricane, there
are some homes that have been rebuilt to the east of the site that are much smaller in scale and dwarfed by the modern buildings. Each home of the MIR project is monumental in its own right. Each design appears to compete for attention, making the development slightly overwhelming.
There is a conflict between all that is wonderful about New Orleans Architecture and what is being built. The need for longevity of the city far outweighs preservation of classic styles. New Orleans is a city that is eclectic and adventurous and more likely to accept daring architecture.

There have been many initiatives done in areas where conventional buildings are not able to be built because of issues with water. Visionaries have been dreaming of building on water for many years. New techniques being implemented out of necessity are now becoming a reality.

The Double Perimeter Block project by Bjarke Ingels Group (BIG) in Holbaek, Denmark is an example of a project design around its perimeters. The project creates a connection between the existing harbor and the city. The form for Double Perimeter was developed to make room for sails. The three story rectangle was raised at opposite corners to allow passage of ships below. The interior spaces of the development at the raised areas have large ramps for vehicular and pedestrian traffic.

The upper pathways of the development are punctured to allow for light to get into the lower areas. Pedestrian boardwalks move under the development of stacked slender units. The care of promoting the different uses is what gives the project its richness.
The Plan Tij in Dordrecht was designed as “wet-footed architecture,” in a development standing on an existing urban site. Instead of competing with the land, Klunnder Architecten designed in harmony in an effort to maximize otherwise uninhabitable area. The modern boxes are enriched by the voids that dictate different living spaces. They are accessed by raised platforms, but the proximity to the water is a definite advantage for the residents. Each home is fairly open with windows and curtain walls all around to give views of the water.

The overall master plan of the development was to play on movement into the water like a jetty. The buildings are scattered throughout the landscape in an effort not to disturb the landscape. Far more importantly, the initiative to build a new development right in the midst of the urban fabric instead of suburbanizing, was far more effective to the city.
Steven Holl’s Vanke Center was designed to appear as a structure floating above a dried riverbed. Built in Shenzhen, China there is a distinct form raised above the site with minimal punctures to connect the building to the ground. It is a multi-use facility, office space, apartments and a hotel. Holl’s intention was to minimally impact the site while embracing the landscape. The project is massive in scale, yet the places that impact the landscape are minimal. This is a great attitude towards harmonious interaction between architecture and the land it inhabits.
IX Design Intent

A. Proposed Housing Development

The design intent goal for this thesis is to create a new housing development that addresses the issues found researching the architecture, infrastructure and urban fabric of New Orleans. There have been many iterations of the design throughout the process. Each was dissected with a critical eye, considering the research and precedents and revising accordingly, in order to fully explore the design.

The importance of developing monumental structures was explored with straight pathways connecting at different elevations. Emphasis on outdoor spaces was missing from the design. The boardwalks encourages moving through the development, not celebrating any one moment. This thesis stresses the need to rethink the way New Orleans residents live now and into the future. Interior and exterior spaces working in harmony to optimize the potential living experience is important.

The people of the Desire neighborhood embrace outdoor living. This development has to celebrate the things that make the culture thrive. That includes new design ideologies joined together with proven ideas that have been successful. The shotgun style home can be seen throughout the neighborhood and works well in the context. If this style could be introduced into a new and improved development style, it would embody the cohesion of the old and new.
Raising the finished floor elevation of the homes above the worst case scenario flood level is important. What this development explores is the idea of designing a raised platform which allows upper movement to ease the transition of living three feet from the ground to ten feet in the air. An early design included secondary pathways five feet off the ground as a method of easing that transition. Yet there was very little reason for the intermediate space to be used giving it the opportunity to be a neglected space.

Upon considering the life of the site VII Urban Design, B. Site Analysis, 3. ReTHINK Neighborhood, the secondary pathways would prove obsolete in the case of extreme flooding. The pathways would be constructed as free standing and would most likely be destroyed in the case of an extreme hurricane. Creating hurricane safe pathways that tie into the building structure would be more economical, therefore giving them a better chance of withstanding a disaster.

Creating a constant elevated space allows for the obvious connection of the home and outdoor living spaces to be celebrated. The finished floor elevation was raised from 10’ to 15’ to create pedestrian friendly lower space. One advantage of raising the building is the duplicity it gives the site. The private and semiprivate living spaces are
developed above and the activities desired by the community are explored below.

A method of creating a constraint for the project was developing the set of rules for the homes. Allowing for a cohesiveness throughout the site. These rules include shotgun homes for passive cooling. There is to be minimal stationary overhang to prevent uplift in the event of a hurricane. There is an emphasis on creating private and semi-private porches in an effort to place community framework in the design. The finished floor height of the homes must be 15 feet above ground level. Lastly, the homes will be arranged in clusters, much in the way of the multiple homes situated on lots in the existing Desire neighborhood.
The hardest part of writing this thesis was overcoming the worry of making the wrong choices along the way. The research was invigorating from the start. With every book read, and article found, a new way of thinking continued to develop. Yet the subject matter was so important that it became hard to make a decision for the fear of not doing the city of New Orleans justice. The longer this went on, the more time was lost. The desire to develop a solution soon overcame any fear of making mistakes. The process and the overall experience were far more important than any one solution or decision. Once the hindrance was gone, exploring the design process was a pleasure and the challenge of creating an amazing development became a welcome task.

In conclusion, the city of New Orleans has a large task ahead of them. Using the methodologies of architecture, urban design and infrastructure, the proposal of this thesis includes many different typologies that could be used to aid in rebuilding New Orleans.
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