

Strength and Diplomacy: The Architectural Tectonics of an Embassy

A Thesis

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By

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Strength & Diplomacy: The Architectural Tectonics of an Embassy



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Abstract:

Embassies are essential to global negotiations and are representations of some of the complex governments around the world. Many of the United States older embassies are becoming antiquated and over-crowded, but more importantly their design is inadequate to deal with current security conditions. In this past decade, explosive attacks have increased fivefold. More than 11,000 people were killed in terrorist attacks in 2012. With these contemporary conditions, a change is needed to the design of the embassy. How can the architectural tectonics ensure the safety of inhabitants of an embassy? Inspiration for basic modern design defense strategies can be realized from significant historical enhancements of fortresses due to similar circumstances. Warfare changed considerably during the 14th century. Assessment of previous terrorist attacks will show the vulnerabilities of current buildings. This will provide a list of key design elements to deal with present security concerns. A few case studies will offer creative ways to apply different safety elements from site to structure. The objective is to minimize human casualties while still promoting a diplomatic dialogue between nations.

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Strength and Diplomacy: The Architectural Tectonics of an Embassy

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INTRODUCTION

Our world contains diverse governments that are complex and often contentious; simply not everyone gets along. Embassies are essential to global negotiations and are representations of some of these governments. How can the architectural tectonics of an embassy ensure the safety of inhabitants and promote peaceful collaboration?

Our world has become smaller in a sense, small due to ease of global communications and integration of diverse economies. These same technologies that provide equal international opportunities to large and small business also allow terrorists to organize effortlessly.ⁱ According to the Department of Homeland Security statistics, current global terrorist activity conditions are growing with almost 7,000 attacks that cause over 11,000 deaths and more than 21,000 injured in 2012.ⁱⁱ In the past decade explosive attacks have increased fivefold, making explosives the new conventional weapon of our times (Fig.01)ⁱⁱⁱ. Knowing these conditions, I believe architecture can provide protection from future attacks without shutting out the rest of the world. After the private sector, government buildings are largely targeted due

to their symbolism are increasingly pursued for future terrorist attacks. An embassy symbolizes a nation's principles while sometimes working in contrasting territories to promote peaceful collaboration.

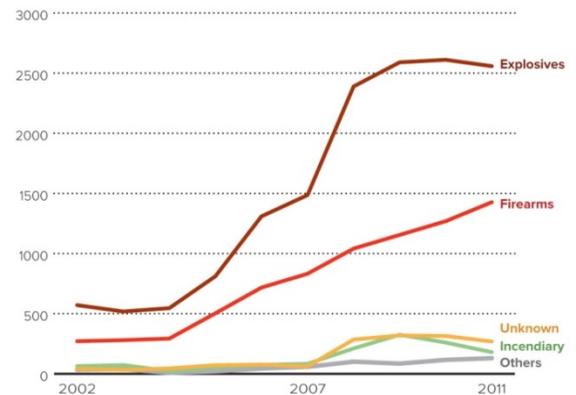


Figure 01: Type of Weapons Used

METHODOLOGY

This paper discusses appropriate architectural tectonic methods to provide safety to the inhabitants of an embassy. A brief review of the United States' embassies' history will help understand the evolution of embassy building typology. Historic precedents of similar concerns provide inspiration on basic methods of providing defense that is perhaps overlooked in today's design strategies. The assessment of previous terrorist attacks upon embassies will reveal an understanding of

vulnerabilities in previous building tectonics. This will supply a list of current security concerns that will be of importance for design against future attacks. A few case studies will offer imaginative ways to apply design safety elements. Each case study will have a particular focus: manipulation of terrain, construction strength, the stand-off zone, and the building façade. My objective in this study is to suggest architectural strategies to minimize human casualties while still promoting a diplomatic dialogue with other nations.

BUILDING TYPOLOGY

US Embassies are symbolic buildings that have many users; State Department, Foreign Services, oversight committees, ambassadors, expatriates and taxpayers. Besides functioning as an emergency contact when visiting another country, embassies help to improve political, economic, and cultural relations with other countries. These complexes maybe comprised of office buildings, annexes, guard quarters, utility buildings, parking and security systems for protection. Embassies share the characteristics of an enclave, for they are in other countries completely surrounded by foreign territory. The site is the only thing between the building and a friend or foe. Harmony exists between two territories through borders and common agreement to respect those borders. How boundaries are marked may provide a dialogue between the two territories that suggests a peaceful or distrustful border. There is a need for strength, yet diplomacy must also be displayed.

BRIEF HISTORY

The United States Department of State (DoS) was created in 1789 and is the federal executive department responsible for international relations of the United States. The first US diplomatic building was gifted by the Sultan of Morocco in 1821. It was not until the Lowden Act in 1911 that allowed the US to buy property abroad. By the 1920's the United State only had a few diplomatic buildings abroad. After World War II increasing global interests became essential to America. America used the embassy building program to help define its world role. America wanted to be seen for its generosity and beneficial international relations. This building program was initially funded with foreign credits, not taxpayer dollars. In the early 1950's, the embassies were designed in a minimalist style, for modernism was connected to the notion of freedom after the war. The conditions of this time easily permitted transparent and open design in embassies with excessive glass and steel construction.^{iv}

In the 1950's and 60's, US Embassies had only experienced a couple of security aggravations. These skirmishes by vandals and protesters caused little damage to the embassies. One of the earliest terrorist attacks on a US embassy was in Saigon in 1965. A bomb was set off outside the embassy which killed 20 people and injured 183. This pushed the State Department to reconsider future designs of embassies with high walls to increase perimeter security and testing of blast resistant construction. During the 1970's, the attacks increased, including

assaults and hostage situations. This caused the State Department to increase protection with Marine guards. The high-risk embassies were retro fitted with guard houses, security check points, security cameras, and vehicle barriers. The US embassy in Dublin had gold laminated on its windows in order to be more blast resistant. Some embassies were impossible to retro fit to meet security needs, like the 1959 US embassies in Ghana built on stilts.

There were over 240 attacks on US diplomatic structures between 1975 and 1985.^v In 1983, the suicide bombing of the US embassy (killing 63 people) and Marine barracks in Beirut (killing 241 U.S. military personnel) mandated action from our government. Bobby Inman was appointed in 1985 to head the Advisory Panel to Overseas Security. The Inman's Report set a new standard for security including 100 foot set-backs, perimeter walls, blast resistant construction, fewer windows, safe rooms, large remote sites and lots of other electronic systems. This contributed to future structure that dominated the landscape with its imposing size and appearance. Using Inman's new security standards 61 new projects were started by 1986^{vi}. At the time, Inman's Report was never entirely executed, for it would have been too costly to replace every US embassy. Not only was the cost an issue but the State Department lost its influence with Congress due to two scandals exposed in 1985. One scandal in Moscow included Soviet espionage. Many Soviet bugs were placed in the embassy offices. Even though Inman's Report was never officially the standard, over twenty

projects during the 1980's and 90's were executed using his security standards. These embassies resemble fortresses, not a welcoming office building open for business. Inman's recommendations would finally become part of the law within the Secure Embassy Construction and Counterterrorism Act of 1999. Furthermore in 2004, the Architectural Advisory Panel for US embassies was abolished. 52 new embassies were built between 2001 and 2010 with another 34 in development, most built with new standardized design and safety as its only concern.

HISTORICAL FORTIFICATION

Earth Works are the earliest forms of known defensive structure dating back to the Bronze Age. In northern Europe the Gród is the oldest remnant of fortification built prior to 1300 BC. It is an earthen rampart ring with wooden walls and a moat. Bergfrieds were tall wooded lookout towers that bordered the frontier of the Roman Empire 800 BC to 500 AD. Hundreds of years later, these towers took a more integrative part of the castle's walls. By the 10th century, the Norsemen would enhance the earth works, providing two new fortification strategies: a motte and a bailey. A tall tower stood upon a large mound, known as a motte, sitting in the middle of a courtyard, known as a bailey, surrounded by a wooden palisade wall. More complicated systems had two or three baileys, each with a distinct palisade wall. The tall tower would later become the keep, which is usually the safest place in the castle. During the 11th century, stone started to replace some of the

wood structures and masonry became even more common in the 13th century.

In the 14th century, warfare changed due to the growing use of black powder weapons. A new evolution of military fortification architecture was needed to withstand the explosive impact caused by cannons. The old flat high walls and tall towers became easy targets of large destruction. The new design was demanded and profit was to befall the inventor of such a design. Many scholars, architects, and artists applied themselves to this task; Michelangelo, Leonardo Da Vinci, and Albrecht Durer were a few that were well known to apply their skills to this task^{vii}. Military engineers and architects would provide a basic scheme that required low, thick and sloped walls and elimination of the towers to reduce damage caused by artillery attacks. The bastion would replace the tall towers providing better protection and a vantage point for return fire.

Sebastian Le Prestre de Vauban was the Marshal of France in the 17th century. Although he was not the inventor of the

bastion he was a military engineering genius, who exploited the bastion design making him one of the most famous fortress builders. Vauban's modifications to the bastion design were governed by his geometry and adaption to each specific site. This allowed him to build over 180 fortresses that were never captured while he was alive. Some of them even held up to the German artillery, infantry and dive bomber attacks in 1940. These bastion fortresses seem to have the most applicable design characteristics to our current condition.

The design of the new US embassy in London shares some of the bastion characteristics along with older fortress designs. Designed by the Kieran Timberlake firm, it is currently under construction and is due to be completed in 2017. It has received mix reviews towards its adaptation of fortress design to reduce the need of high uninviting walls. It is easy to pick out the defensive features from the aerial render (Fig.03)^{viii}. It will be interesting to see if the same is felt from spectators at ground level once it is completed. I believe the concept of the revision of these defensive

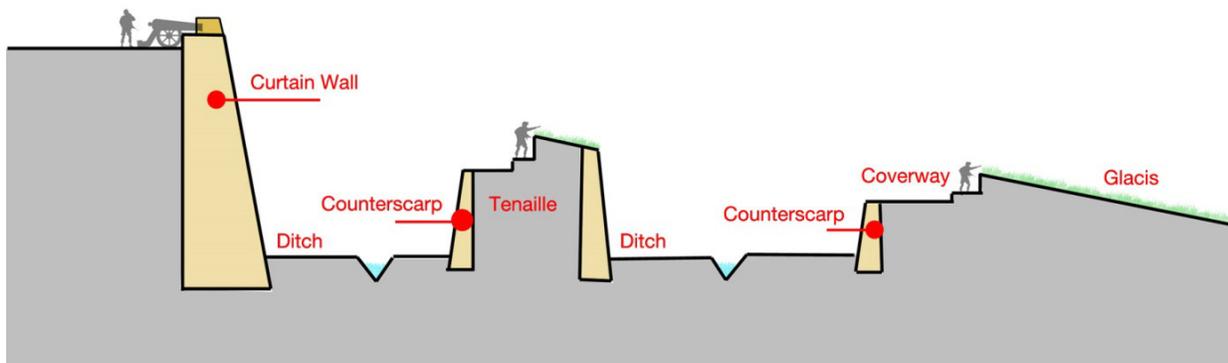


Figure 02 - Site Section of Typical Bastion Fortress



Figure 03: Aerial of Future US embassy in London

concept of the revision of these defensive features was appropriate for our current security needs, but I am not sure if all of the applications were properly executed. These new design shortcomings are the parts seemingly inspired by older fortresses prior to the bastion. The site is only 4.9 acres, not allowing for a large set back. At such a short distance, the glacis may stick out rather than becoming part of the landscape. A glacis is a gradual sloping plane that slopes down from the structure. There is no real protection from a blast wave prior to the defensive screen attached to the façade of the towering building.

PREVIOUS ATTACKS

On August 7, 1998, there were two coordinated US embassies bombed within five minutes of each other^{ix}. These two bombings took place in Tanzania and Kenya. In Nairobi, Kenya, around 10:30 am local time, a truck packed with explosives was set-off in the rear parking of the embassy. The truck forced its way through the unmanned exit gate. This blast killed more than 400 people and injured around 4,000 others. The US embassy was a five-story reinforced concrete building, so there was little actual structural damage. The massive explosion destroyed most windows and interior office partitions. Most fatalities inside the building were caused by the flying debris, and the collapse of an adjacent building caused most of the other casualties.

This site only offered a fifteen foot setback, which is an inadequate stand-off zone for explosives. Sitting at the corner of a very busy intersection increased the ease of vehicle attack. A lack of guards at the exit allowed the truck to get even closer to the target. Though there was a coating on the glazing, the window framing was not properly anchored. The reinforced concrete structure was the only thing that prevented a full collapse of the building. In Dar es Salaam, Tanzania, only a few minutes later, a similar attack took place, but due to the manually operated gates, the bomb was set off prematurely. Though the truck never passed the first line of defense, it was only 35 feet away from the structure. There was severe damage to the building, but fewer casualties, totaling 12 deaths and 85 injures.

On September 11, 2012, armed men attack the US consulate in Benghazi^x. Most of this event's information is still classified, but Chris Stephen, a correspondent from a British national daily newspaper supplied some key events from that evening. Armed men stormed the embassy gates around 9:40 pm and set fire to the guard house. These militant men used an RPG to blow open the door and set the ambassador villa ablaze. The ambassador was moved to the safe room a moment before the armed men made it to the villa. Unfortunately, due to the design of the safe room, the smoke poured through the iron bars, killing US ambassador Christopher Stevens and three other embassy staff. This consulate was overrun by a handful of men, showing how inadequate the compound fortification and safe rooms were.

Most recently in 2013, two different types of attacks occurred. In February by a suicide bomber wearing an explosives-packed vest, blew up a security guard and guard house at the US Embassy in Ankara, Turkey. The sally port design did stop the terrorist from entering the compound, but was unable to save the guard's life. In September, a group of 7 terrorists attacked the US Consulate in Herat, Afghanistan. The armed men attacked the gate with assault rifles and rocket-propelled grenades. After the initial attack, a truck bomb exploded killing two security guards, wounding twenty others and leaving massive damage to the front gate. The attack was stopped by vigilant armed security guards. These two attacks show different scenarios for which different defense strategies are needed to be more effective. Perhaps an electronic prescreening area before entering the sally port could prevent future casualties. Maybe a modern modified ravelin would prevent direct attacks on the main gate of the complex. A ravelin is a triangular outer structure that protects this entrance from enemy fire.

These are only five of over 220 attacks on US diplomatic buildings in the past decade in most cases explosives were used. The State Department now requires a minimum of a 100 foot stand-off zone to reduce damage from the blast wave. For this to be fully effective, one must stop the bomb at the perimeter with effectively controlled entrances and exits. Barriers are the key elements for stopping terrorist activities. Designing fortifications against explosives is of major importance, but one should not forget about small militant

ground attacks as well. Panoramic views are important for guards to visually see any trespassers, enabling the complex to stay alert. Although obstacles can help to reduce the explosive's efficiency, they can also obstruct views. There is considered three layers of defense: 1st is the perimeter, 2nd is the stand-off zone or area between the border and structure and the 3rd is the structure. At each layer there needs to be appropriate barrier intensity to combat various scenarios. These barriers need to provide protection without ostracizing the community that it is supposed to be supporting. Each defensive design element must not be merely applied, but incorporated in order not to impede another.

CASE STUDIES

Case Study #1

The Castillo De San Marcos was built between 1672 and 1695 making it the oldest masonry fort in the continental United States. This is the only surviving 17th century military construction in the US and is an example of a "bastion" fortification. St. Augustine was a crucial defending point and this fort protected Florida's east coast and commercial trade route. *The Spanish had little option but to construct the fort with coquina stone, for it was the only stone available on the northeast coast. Coquina is a sedimentary rock that is composed from shells making it light and porous nature. The stone's porosity was surprisingly beneficial, for the cannon balls would dig their way into the rock and stick there. The thick walls foundation are 19 feet*

thick and taper to 9 feet thick at the parapet making the cant about 17 degrees. Cannon balls did little damage to the thick *coquina* stone walls structure provided the longevity of this impregnable fortress. Like that of Vauban's forts this Castillo was never captured under combat.

The Castillo De San Marcos sits on 20.5 acres in which the terrain was modified by man to form glacis. These embankments protected the lower fort walls. The lower ground behind the glacis is the covered way which provided soldiers outside the castillo protection from enemy fire. The moat was usually kept dry, but could easily be filled with sea water in case of any land attacks. The sally port is the only entrance in and out of the fort in which one has to cross two different drawbridges on either side of a ravelin. This stellar castillo is made up of guard rooms, storage rooms, a power magazine, a prison cell, a chapel, central courtyard, and the gun deck.



Figure 4: Southeast Bastion

The focus of this case study is the manipulated terrain that shielded the lower fort walls, for its alluring landscape conceals the forts size. The east castillo's elevation which faces the coast waterways was not

hidden to intimidate any possible invading enemies (Fig.4). The sides facing the town look less menacing due to the glacis. The perception standing at the bottom of the glacis make the fort seem to barely penetrate the landscape (Fig. 5). From land attacks the glacis was the first line of defense and protected the lower fort walls. Glacis can be used for protection and reduce an imposing structure size on a site. The glacis design element is very beneficial offering protection while being aesthetical pleasing.



Figure 5: Castillo South Elevation

Case Study #2

The One World Trade Center was designed by David Childs of Skidmore, Owings & Merrill LLP. This building is a symbol of American economic status and a high risk target for terrorism. This project faced difficult challenges like the small vulnerable site and the towering height of 1776 feet. Three sides of the site are bordered by streets, the subway runs nearby and the base of the building at 200 square feet covers most of site (Fig.13). The foundation supports the concrete and steel construction of 104 floors above the ground, clad in glass and topped with a metal spire getting to its

symbolic stature. It cost over \$3 billion dollars using 200,000 cubic feet of concrete, 1 million square feet of exterior glass, and 45,000 tons of steel^{xi}.

The new enormous and redundant steel structure moment perimeter frame is bolted or welded together. The heaviest steel node weighs 80 tons by itself. The core is made of thick concrete shear walls using a special chemical engineered to be super strong at 14,000 psi. That is almost twice the strength of than normal concrete. At the lobby the core is made of reinforced concrete walls up to 6' thick. The outer shell of the first 20 stories of the redundant steel structural was constructed to withstand a mass truck bomb. This is needed due to the minimal standoff zone of the site. Above the 20th floor the structure is clad with a high performance insulated modular curtain wall. Each one of these modular glazing units weights up to 6,000 pounds.

The focus of this case study is construction needed to respond to the minuscule setback. Super strong engineered concrete was used for the massive thick shear core walls, encase the extra wide pressurized stairs, and house emergency communication cables, air shafts, water pipes, and elevators. The redundant steel moment structure frame geometrical shape helps reduce the wind loads. These two structures form a hybrid system that provides significant rigidity and avoids disproportional collapse. The one early failure was the decorative prismatic glass that was originally to clad the lower 20 stories which did not meet blast-resistance requirements. Although

SOM believes they found an equally aesthetical pleasing cladding, the base looks dull and less open with only transparencies at the entrances and clerestory windows on north and south elevations. This new super structure has half the office space of one of the old towers, but it is designed to withstand bombs and planes. This structure hybrid system pushes each material's strength to maximum to deliver protection.

Case Study #3

The GSA Federal building in South Florida was design by Krueck and Saxton architects. As a US federal building it is a symbol of American politics and, therefore, a high risk target for terrorism. The site is 20 acres which has been restored back to its natural wetland conditions. The complex is made up of a parking garage, annex and two main office buildings. The footprint of these offices buildings are 60 feet wide by 400 feet long both clad with curtain wall system and white aluminum shading devices. Although the façade looks delicate it was designed to withstand explosive blasts and hurricane winds. The narrow buildings are oriented to the East and West to minimize solar heat gain, allow for abundant daylighting and generous views on each office floor. This project was designed with innovative thoughts on sustainability by reducing wasteful consumption while collecting on site renewable energy sources. It is being projected to be net zero building by 2030.

The focus of this case study is the innovative design toward the stand-off zone

requirements. The solution was to restore most of the site back to its origins of the Florida everglades. The restored wetlands will provide habitats for local foliage and wildlife. This recovered ecosystem will also allow for storm water management, cooling for the building mechanical systems, and reduce consumption of potable water. This beautiful backdrop while doing all these wonderful things for the environment also provides safety for it is a large set back with a soft marshy soil that is a natural anti-ram barrier.

Case Study #4

The Finnish embassy in DC was design by Heikkinen and Komonen Architexts. This building has an industrial aesthetic due to the visibility of the bronze frame, wires and suspension cables. It was built with a small footprint in order to preserve the trees site. The east and west walls are clad with green granite to blend with forested context. These walls are closest to the sites' edge, which need the most strength. The north and south walls made up of mostly transparent and translucent glass and glass block. This permits natural lighting and attractive views from the interior. These walls have the furthest stand-off and are the only two walls facing a road. The northern side has a large downward slope covered with specialized light poles level with the entrance level floor to extend the views out, but also allow protection from vehicles like ballards do. The southern side has a second wall constructed of a bronze trellis. Most of the industrial aesthetic is softened when the bronze trellis is covered by climbing plants as nature becomes part of the building

(Fig. 6)^{xii}. The crawling green wall and glass façade behind also help to make the building feel more welcoming.



Figure 6: Green wall

The focus of this case study is its façade, for the interesting trellis design element offers a way to reduce a building's imposing structure. This element can be applied to any large wall to diminish the walls daunting characteristic. Foliage can help make a structure more appealing while maintaining its strength and security. This trellis would be the first line of defense and would decrease the damage to the glass wall behind it. From this one design element, how many other variations could help to produce a visual pleasing and welcoming façade?

CONCLUSION

The challenge for embassy design comes from its many users. It must meet the functional needs of the program while providing safety

to all its users. It also needs to be a symbol of our support to the community and host nation. Safety must be the main concern when designing an embassy. However, that does not mean the embassy has to lose its symbolism. The brief overview of the United States' embassies' history, showed the evolution of embassy building typology toward its current fortress state. Historic precedents dealing with changing warfare of the 14th century provided inspiration towards future basic methods of defense design strategies. The assessment of recent terrorist attacks upon embassies has revealed an understanding of some of the buildings strengths and weaknesses. Barriers need to be incorporated holistically so they do not hinder other security needs. The case studies offered imaginative ways to apply different design safety elements. Each of these can be combined and modified for each site and contextualize conditions to provide a more open design.

The objective in this study was to suggest architectural strategies to minimize human casualties while still promoting a diplomatic dialogue. The structure, site, and context make up the architectural tectonics that when cohesively merged together can present an embassy that is strong while still expressing diplomacy.

END NOTES

- ⁱ Thomas L. Friedman. "The World is Flat" (New York, Farrar, Straus and Giroux 2005) Ch 14.
- ⁱⁱ National Consortium for the Study of *Terrorism* and Responses to *Terrorism*. A department of Homeland Security. Annex of *Statistical Information*. May 2013
- ⁱⁱⁱ Figure 01 - Institute for Economics & Peace. *Chart 16 - Type of Weapons*. Chart. 4 in x 5 in Ibid. National Consortium for the Study of *Terrorism* and Responses to *Terrorism*. Institute for Economics & Peace. 2012 Global Terrorism Index. 26.
- ^{iv} Jane C. Loeffler, *The Architecture of Diplomacy: Building American Embassies*. New York: Princeton Architecture Press 2011, Ch. 1
- ^v Jane C. Loeffler, *The Architecture of Diplomacy: Building American Embassies*. New York: Princeton Architecture Press 2011, Ch. 11
- ^{vi} Ibid. Ch. 11
- ^{vii} Jean-Denis Lepage. *Vauban and Military Under Louis XIV* (London: McFarland & Company, Inc., 2010) Ch. 4
- ^{viii} Figure 03 Kieran Timberlake. *US embassy in London*. Digital Renders. 8.25 in x 6.5 in (digitally altered), <http://kierantimberlake.com/pages/view/88/embassy-of-the-united-states-of-america/parent:3>
- ^{ix} US Department of Homeland Security. Federal Emergency Management Agency. *Site and Urban Design for Security*. Fema 430 Dec. 2007. 1-29 thru 1-30.
- ^x Chris Stephen, *Ben ghazi US Consulate Attack*, Web video, (2013, theguardian.com) website. <http://www.theguardian.com/world/video/2013/sep/09/benghazi-us-consulate-attack-questions-video>
- ^{xi} Kenneth Lewis & Nicholas Holt. "Case Study: One World Trade Center, New York". *CTBU Journal*, Issue 3, 2011. 14-19
- ^{xii} Fig 13 - Craig Hinrichs. *Finnish Embassy*. Digital Photographs 14.25 in x 10.75 in. Private Collection.

BIBLIOGRAPHY

Articles/ Journals:

- Falkner, James. *Military History*. 2012 Sept, p34-45.
- Finuean, Karen, "Security that works" *American Planning Association* March 2005: Pgs. 4-5. Print
- Mays, John Bentley, 1941-. *Canadian architect*, 2006 Feb., v.51, n.2, p.33-38.
- Meck, Stuart. "Getting on the Case" *American Planning Association* June 2005: Pgs. 10-13. Print
- Olcayto, Rory. "British Bangkok". *Architects' journal*, 2009 Apr.30, v.229, n.15, p.22-31.
- Olin, Laurie. "The Trouble with Washington" *Metropolis* Nov 2012: Pgs. 54-55. Print
- Therrien, Marie-Josée. "Canada's new face in Korea: Canadian diplomatic complex in Seoul". *Canadian architect*, 2008 July, v.53, n.7, p.26-30
- Smith, Brent. "Look at terrorist Behavior: How they prepare, Where They Strike" *NIJ journal*, n. 260, (2008) p.2-8

Books:

- Delaney ,David. *Territory: a short introduction*. Malden, MA: Blackwell Pub. 2005.
- Harrison, Peter. *Castles of God: fortified religious buildings of the world*. Woodbridge, Suffolk, UK: Boydell Press. 2004.
- Hogg, Ian V. 1981. *The history of fortification*. New York: St. Martin's Press.
- Kaufmann, J. E., and H. W. Kaufmann. *The Medieval Fortress: Caslte, Forts and Waled Cities of the Middle Ages*. Cambridge, MA: Da Capo Press. 2001.
- Loeffler, Jane C. 2011. *The architecture of diplomacy: building America's embassies*. New York: Princeton Architectural.
- Ontiveros, Suzanne R. 1986. *Global terrorism: a historical bibliography*. Santa Barbara, Calif: ABC-CLIO.

- Robert Taylor. *The History of Terrorism*. San Diego: Lucent Books, 2002

Government and Other Documents:

- US Department of Homeland Security. Federal Emergency Management Agency. *Site and Urban Design for Security*. Fema 430 Dec. 2007.
- US Department of Homeland Security. Federal Emergency Management Agency. *Safe rooms and Shelters*. Fema 453 May 2006
- US Department of Homeland Security. Federal Emergency Management Agency. *Handbook of rapid Visual Screening of Buildings to evaluate Terrorism Risks*. By Hinman, Aronld, Errouney, Kennet-Reston, King, and Terrence Fema 455 March 2009
- American Institute of Architects. Design for Diplomacy: New Embassies for the 21st Century. (2009)

Videos and Lectures:

- Sexton, Mark. "Recent Works" of Krueck + Sexton Architects. Presentation at Alumni Hall as part of Architectural lecture series at Miami University, Oxford, OH. March 17, 2014.
- NOVA: Engineering Ground Zero. Directed by Paula S. Apsell. 2011. PBS
- NOVA: Ground Zero Supertower. 2013. PB

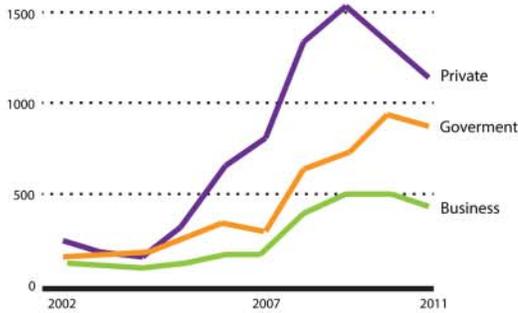
Site
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Issue:

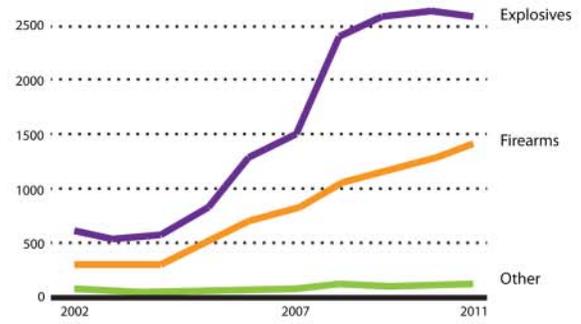
Terrorism

In 2012 there were 7,000 terrorist attacks globally that cause over 11,000 deaths and more than 21,000 injured.

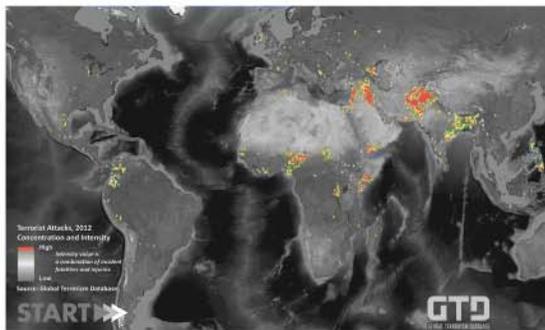
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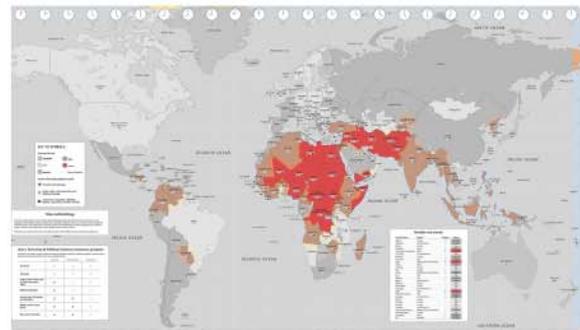
Type of Weapons Used



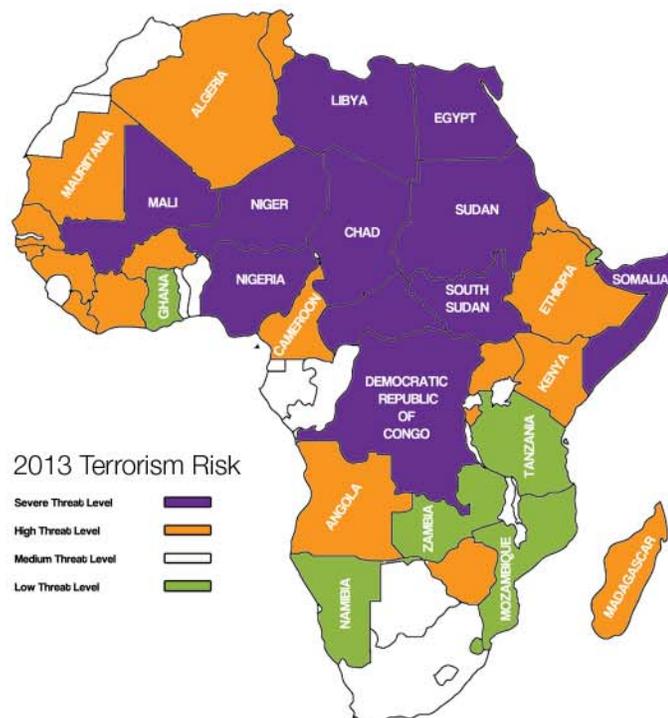
Trends in Targets

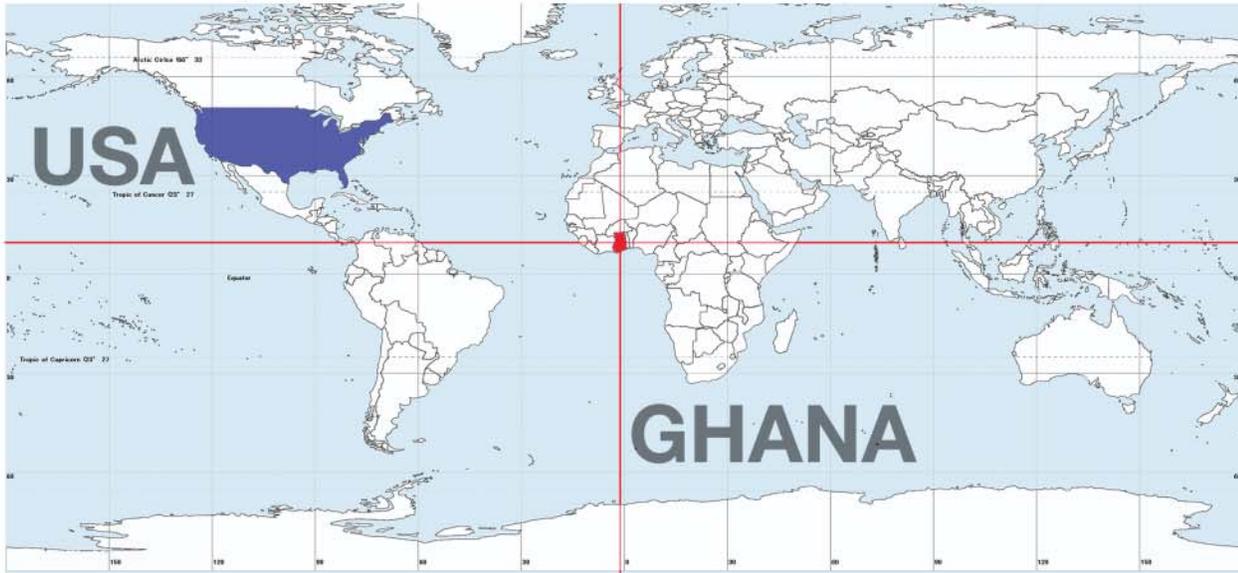


2012 GTD Global Terrorism Activity



2013 Aon Global Terrorism Activity

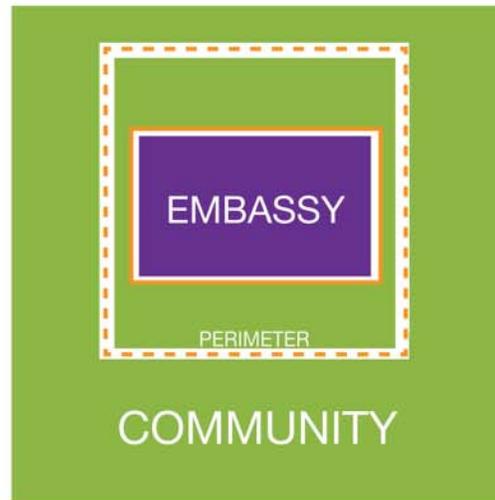
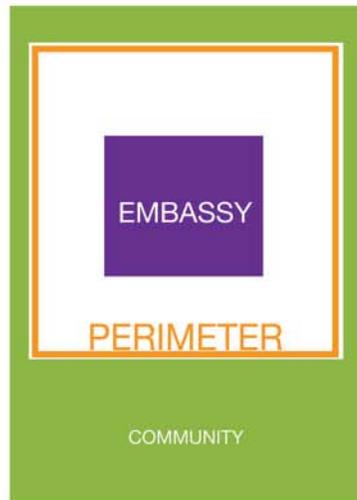
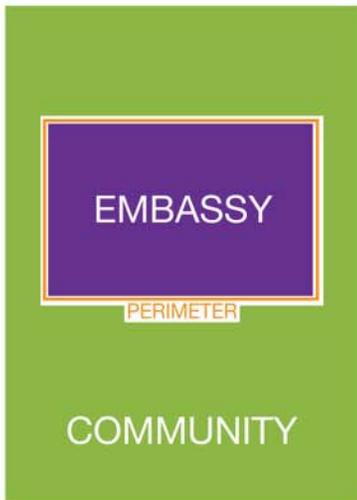




50's Attitude

Current Attitude

Future Attitude



Attitudes of Embassy Design

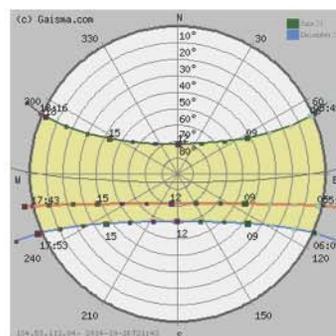
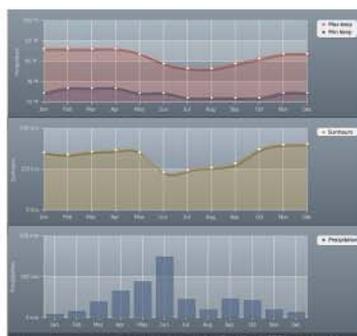
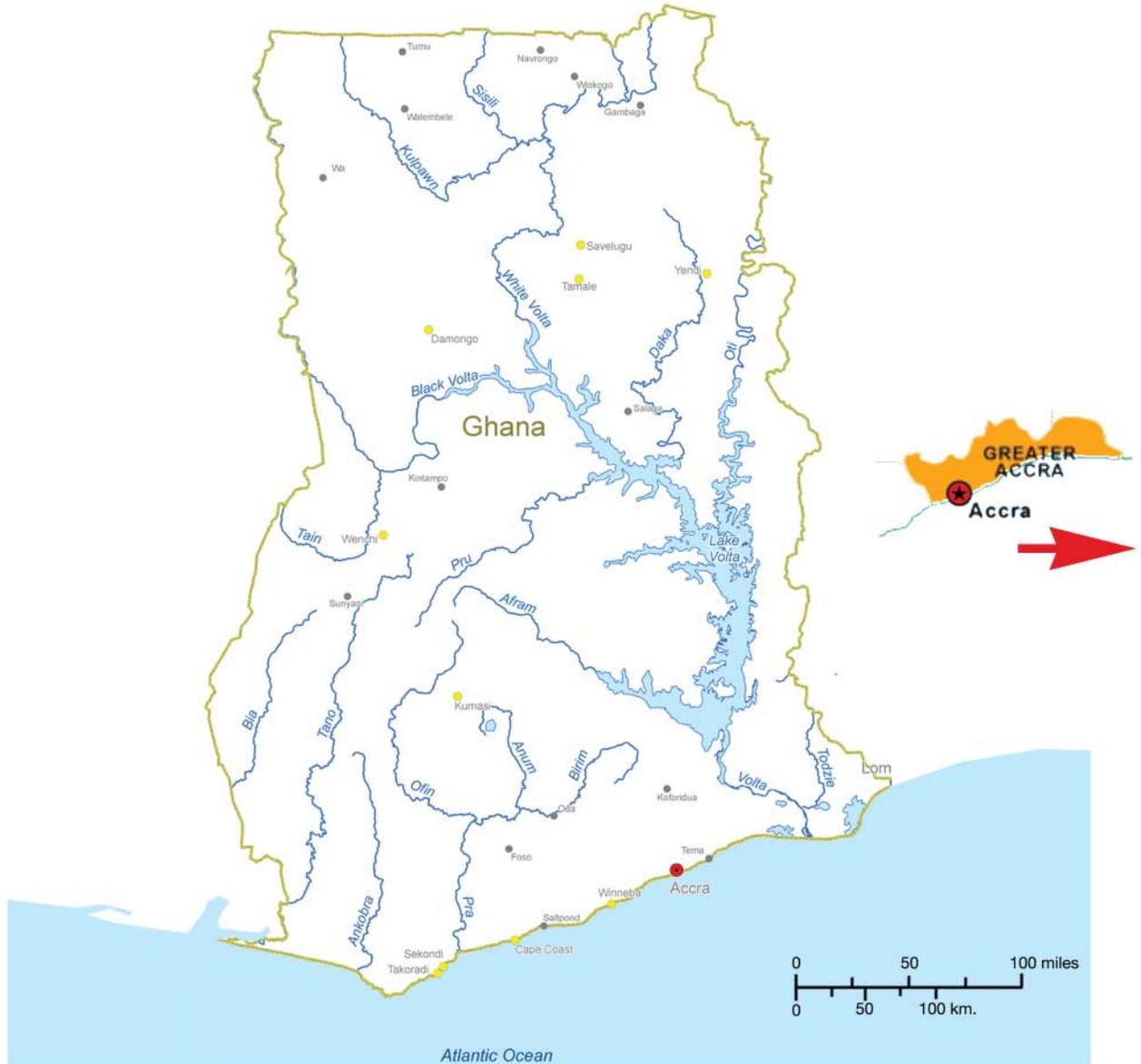


Site:

Ghana

The previous map shows that Ghana is surrounded by high risk countries for terrorist activities, yet Ghana welcomes the United State assistance. The United States established diplomatic relations with Ghana in 1957 following Ghana's independence from the United Kingdom. The United States and Ghana share a long history promoting democracy, human rights, and the rule of law.

I believe this to be the ideal circumstance to build embassy that addresses the current security concerns while still promoting a diplomatic dialogue with Ghana, that of peaceful cooperation



Climate Analysis

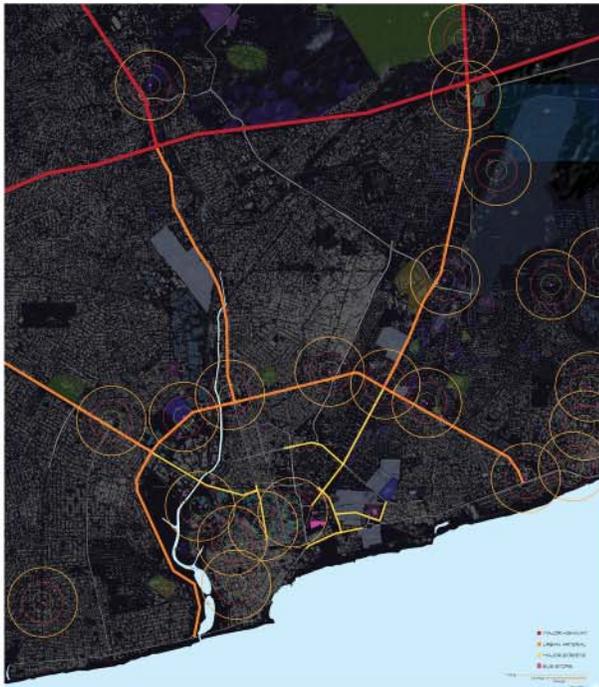


Figure 08: PUBLIC TRANSIT

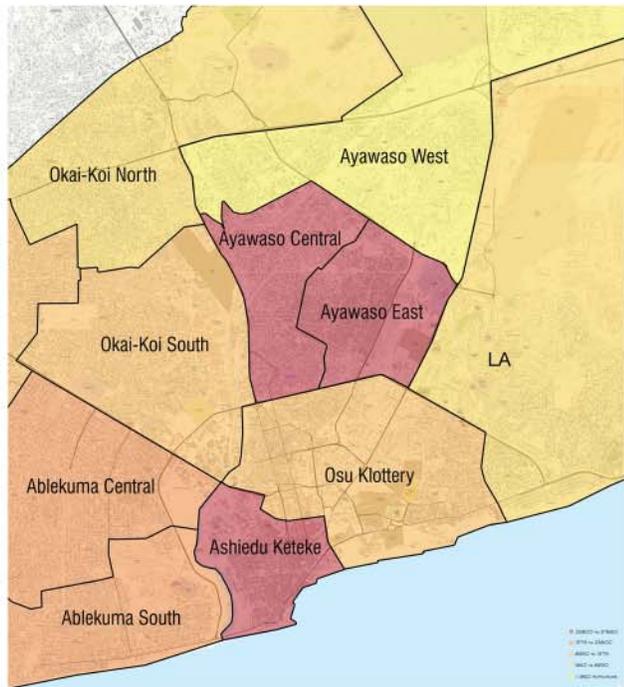


Figure 09: POPULATION DENSITY

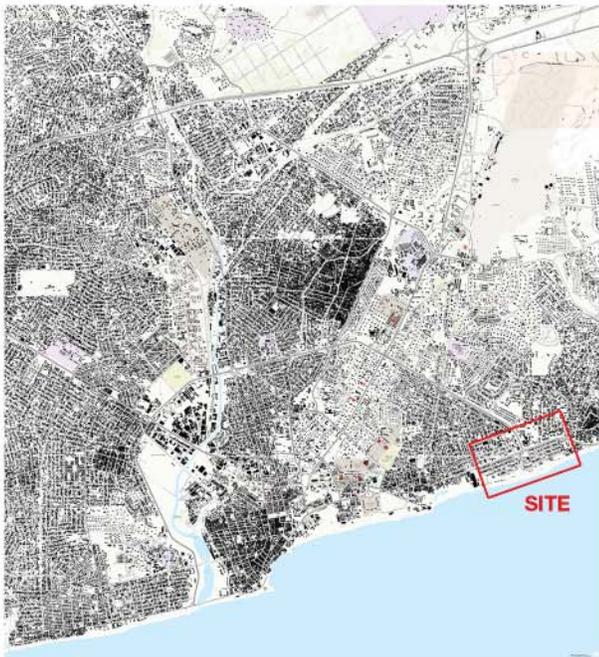


Figure 10: FIGURE GROUND

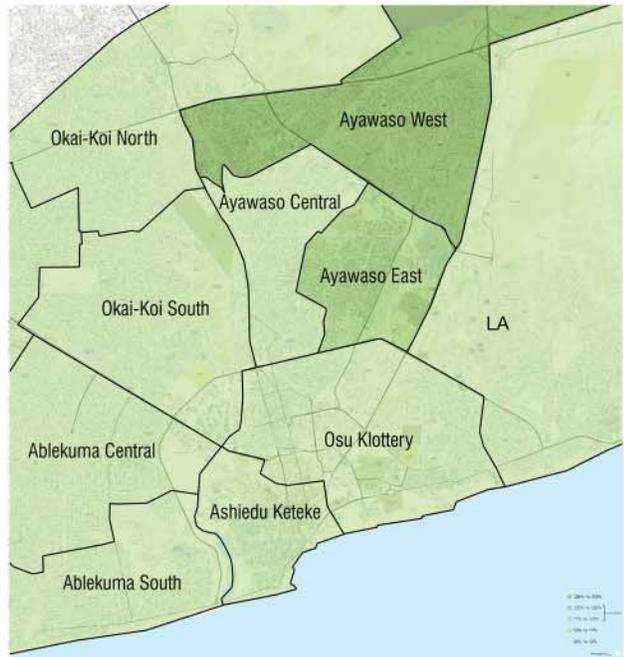
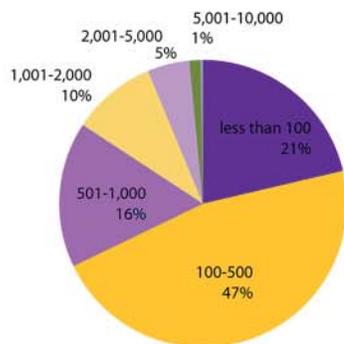
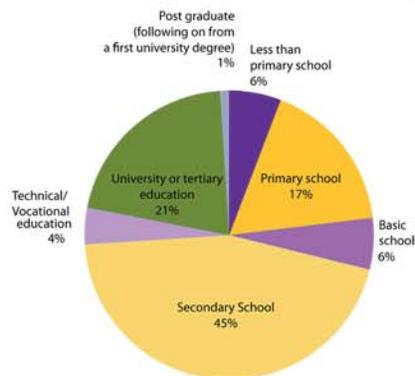


Figure 11: STANDARD OF LIVING



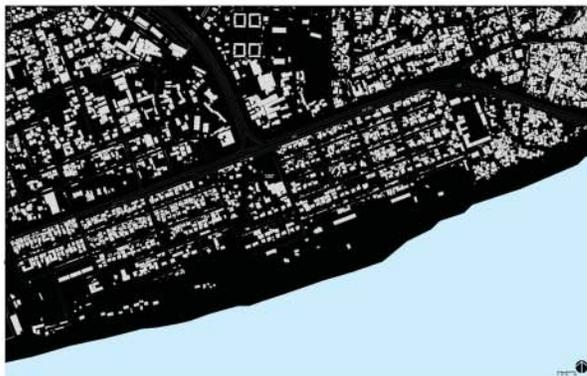
Household Monthly Incomes in the City
(New Ghana Cedis per Month)

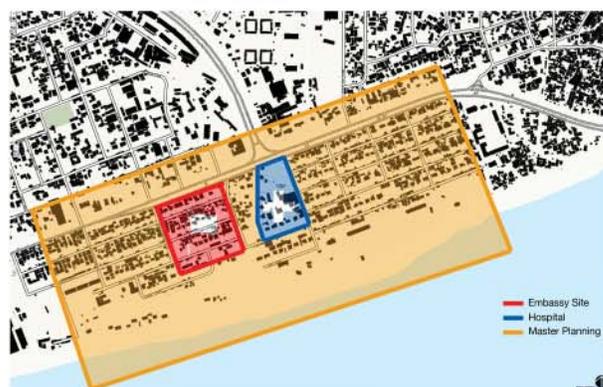


Highest Level of Education Completed
Adult City Residents

Accra Demographics

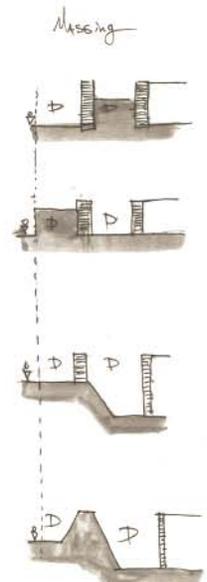
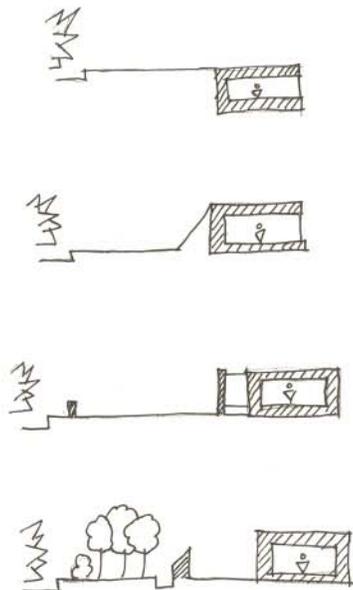
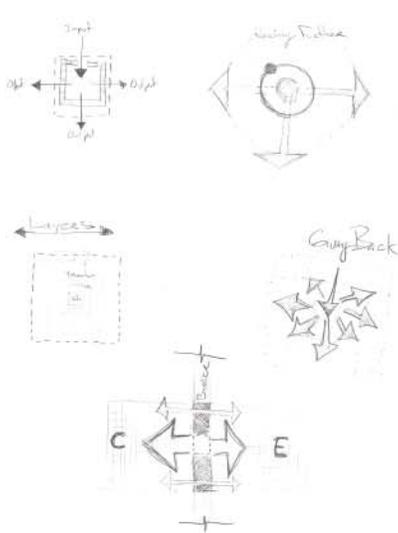
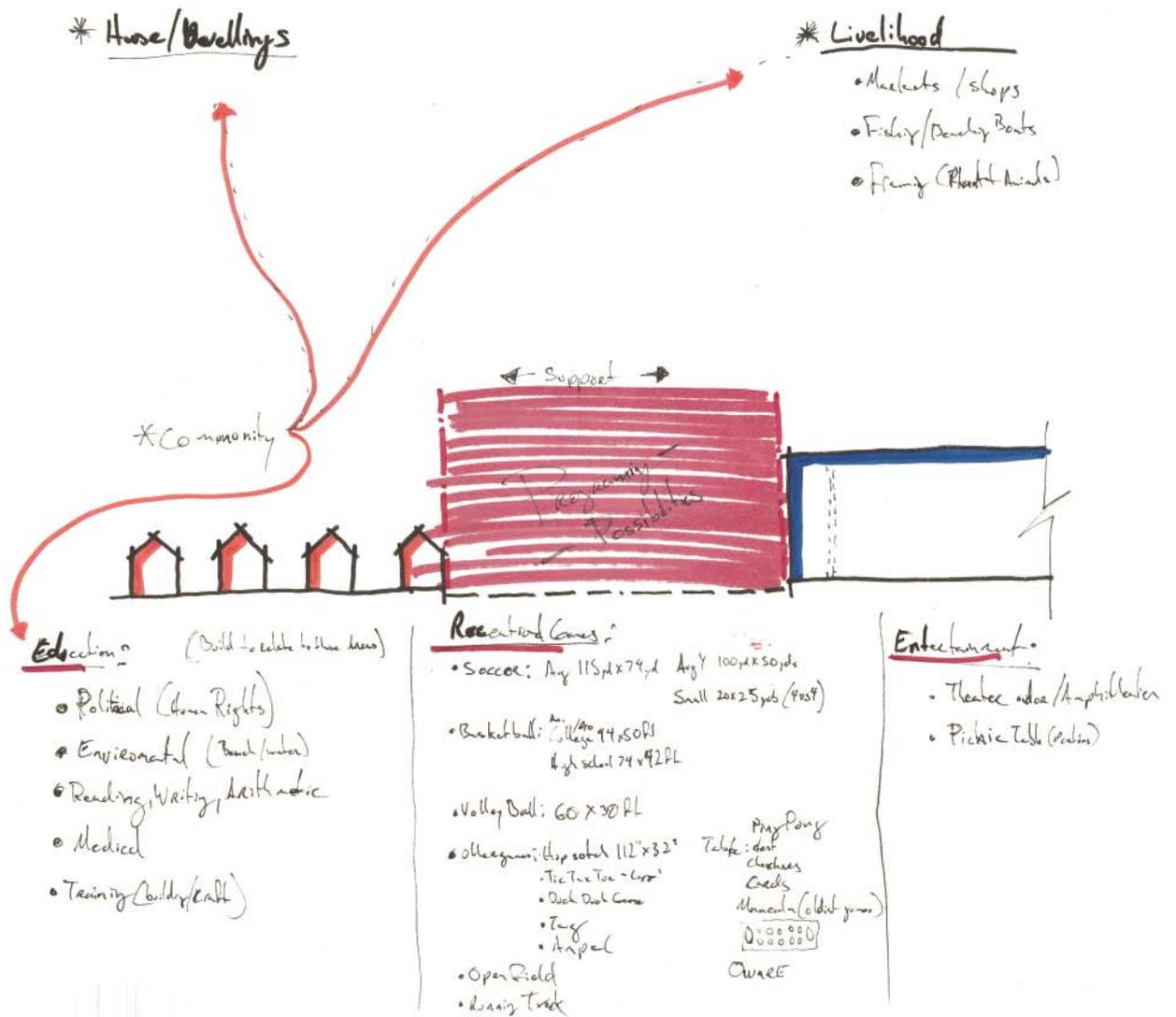
Site Analysis:



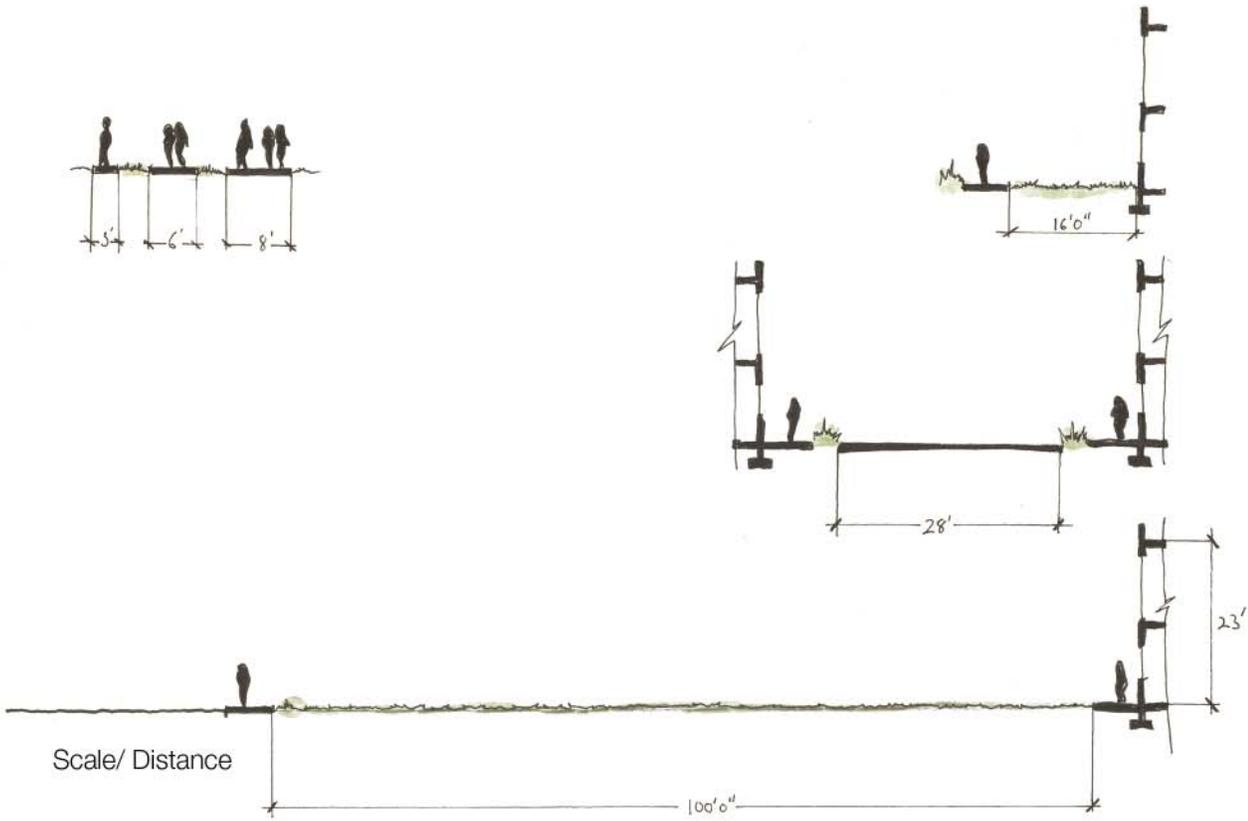


Process
Strength & Diplomacy:
The Architectural Tectonics of an Embassy

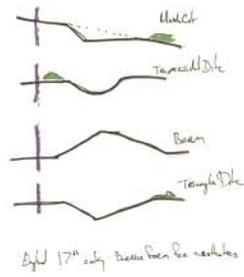
Schematic Design:



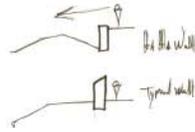
Diagrams



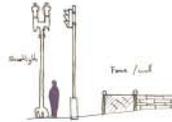
Defensive Methods



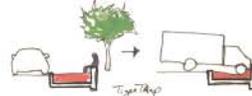
By 17th century there were no mud walls



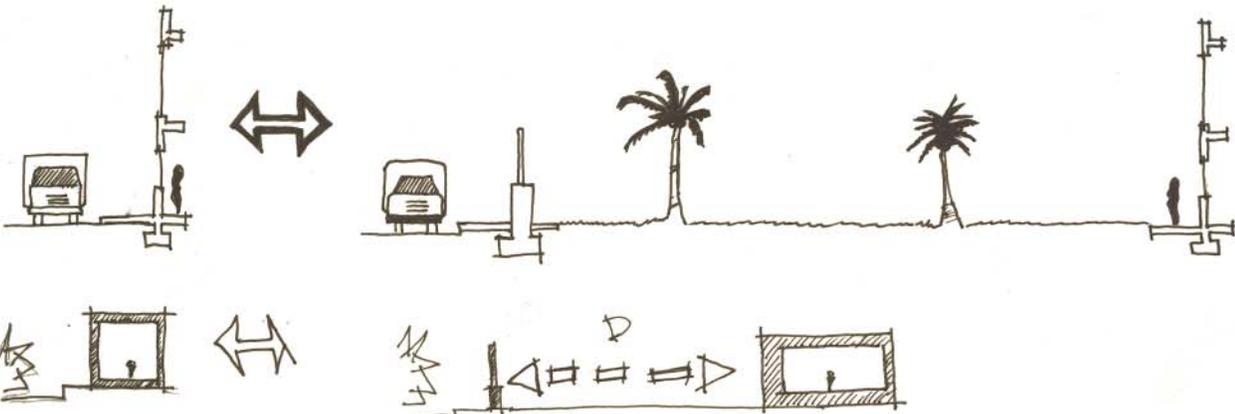
Historical

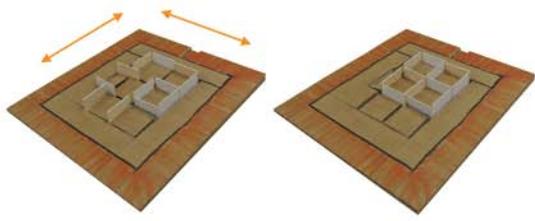
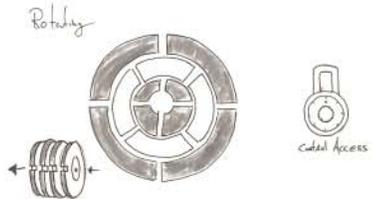
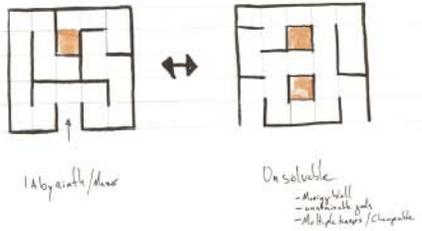


Current: Street scene, Security Elements



Current

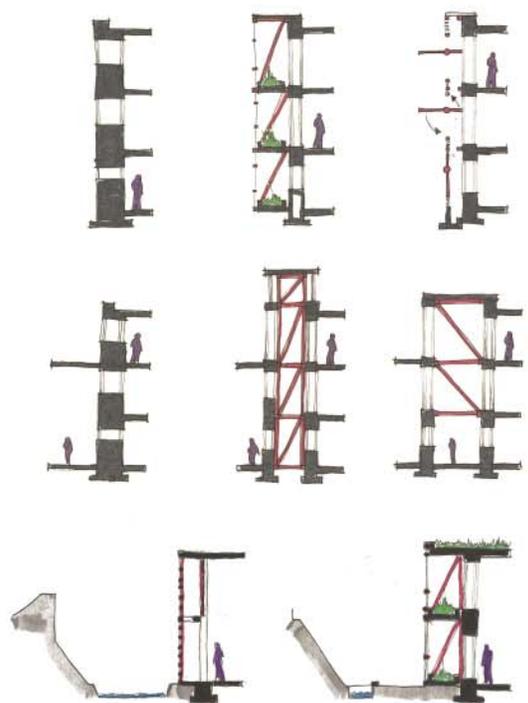
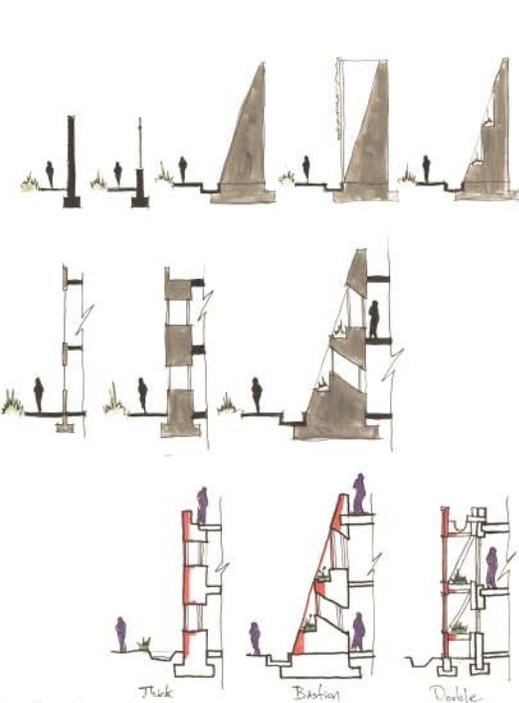




Transformable

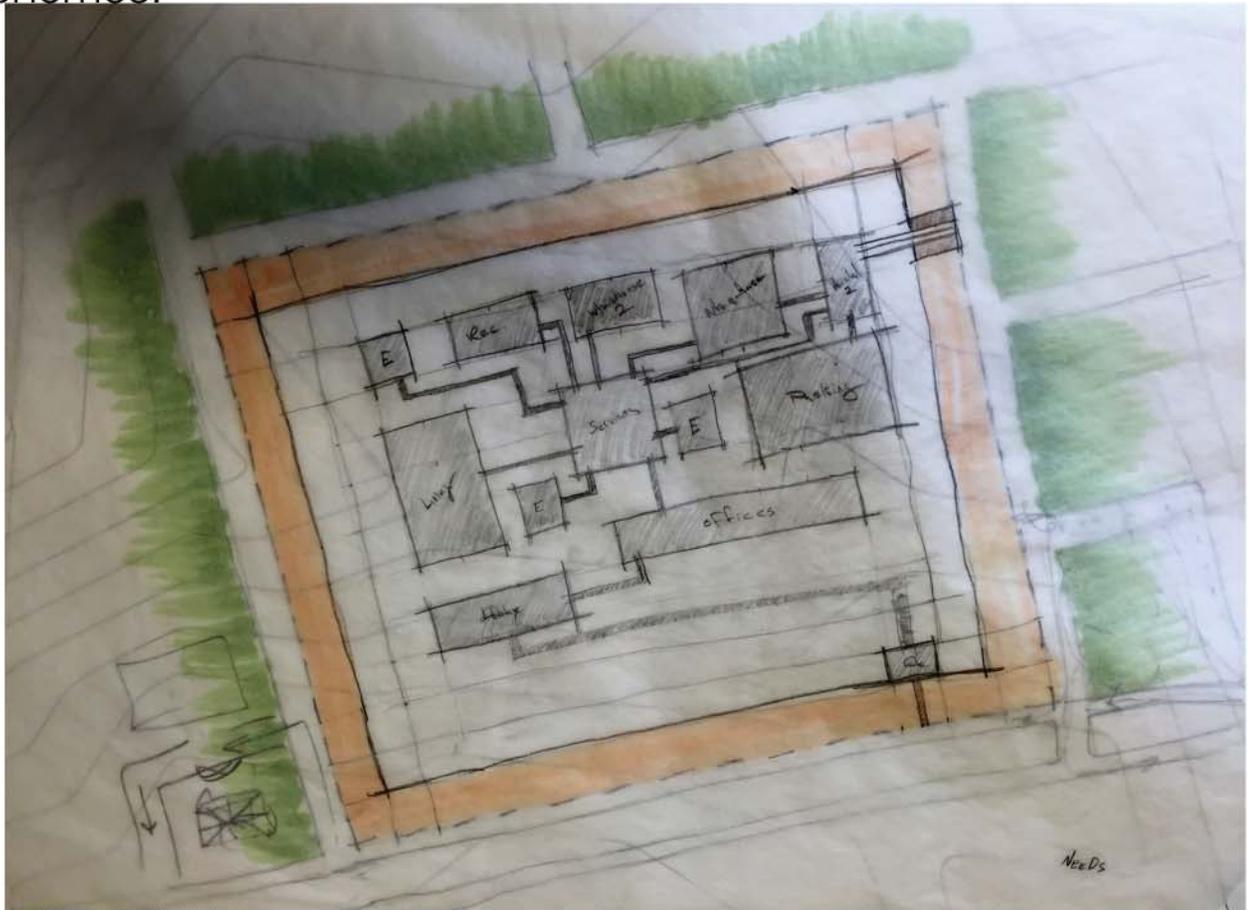


Form



Wall Sections

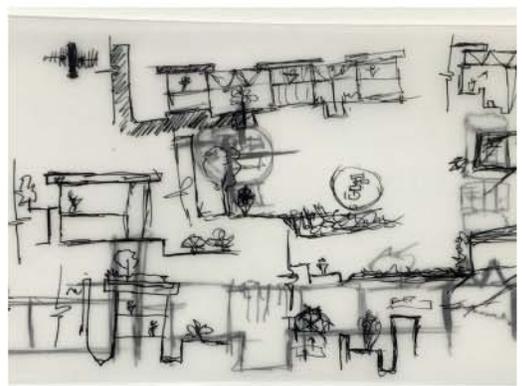
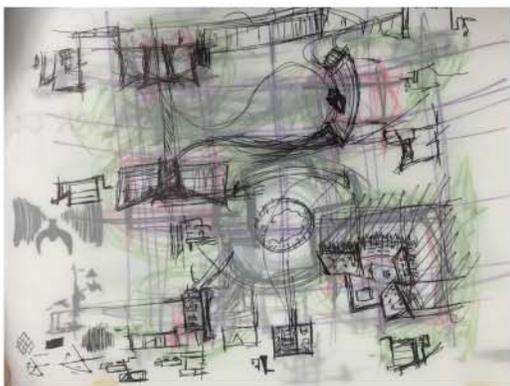
Schemes:

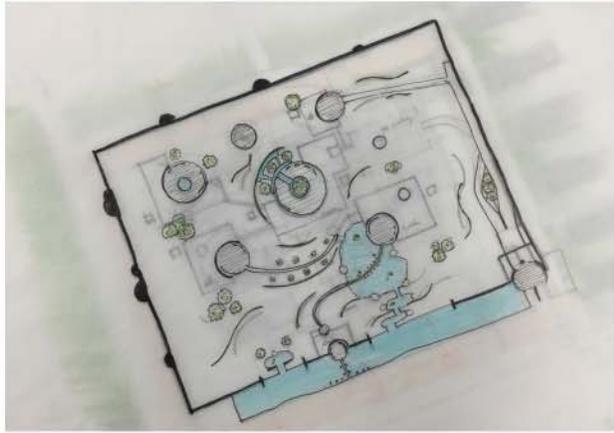
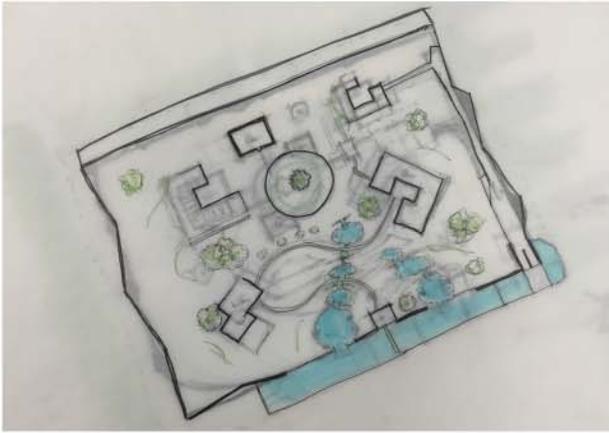


Programmatic Needs

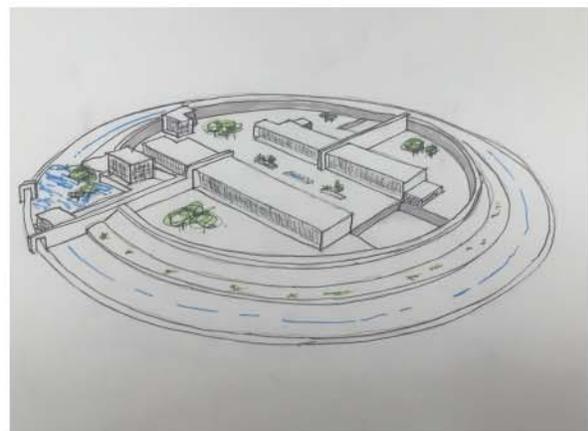
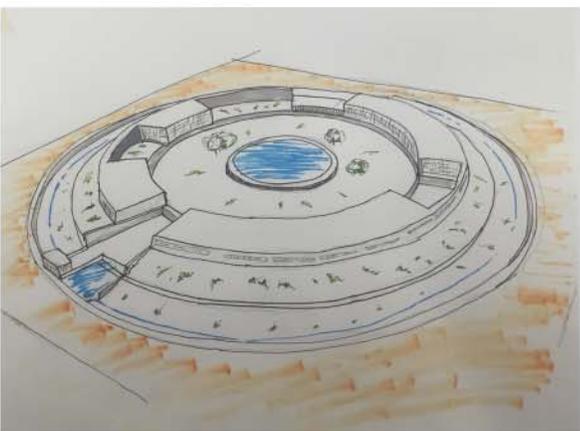
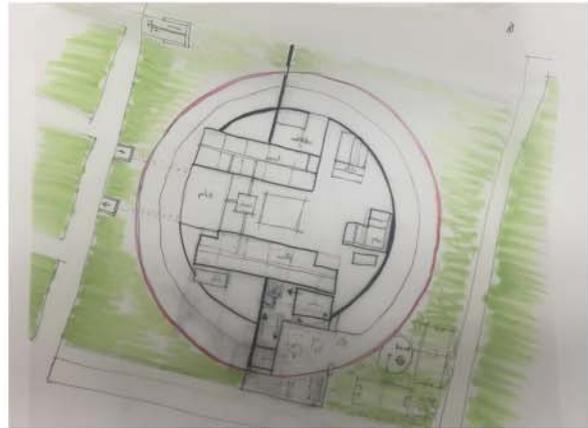
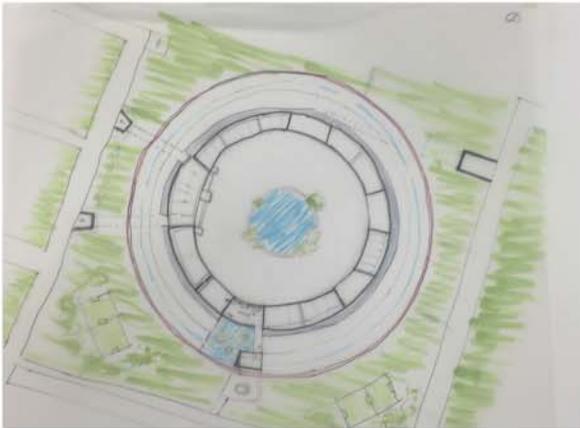


Loose sketching

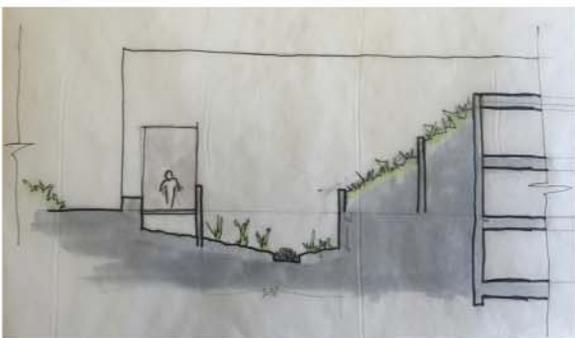




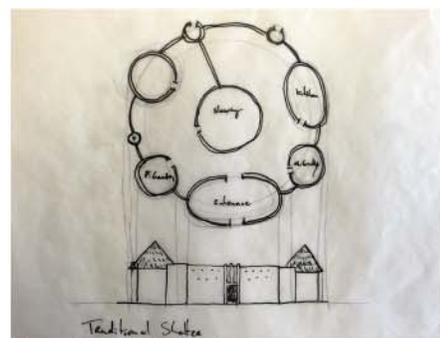
Burying Structure



Path/ Visual Connection

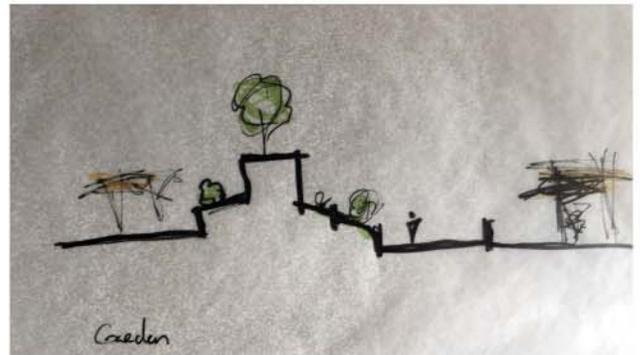
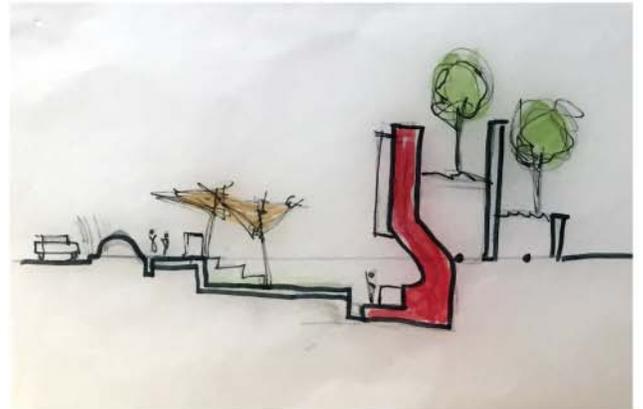
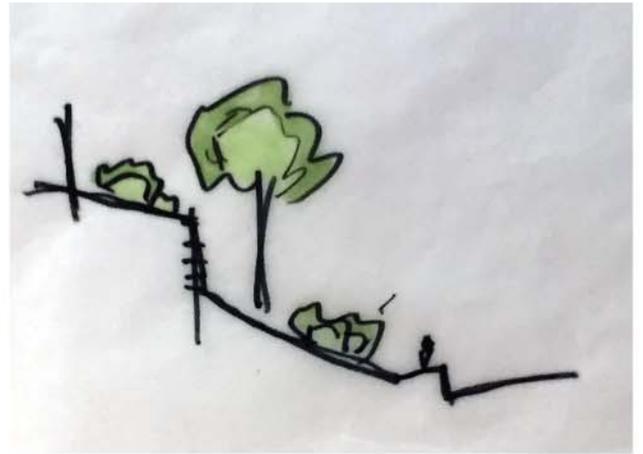


Path Section



Traditional Structure
Historic/ Traditional

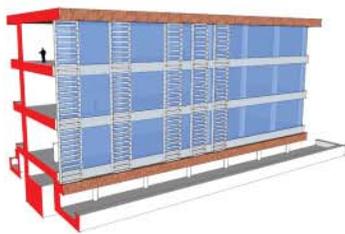
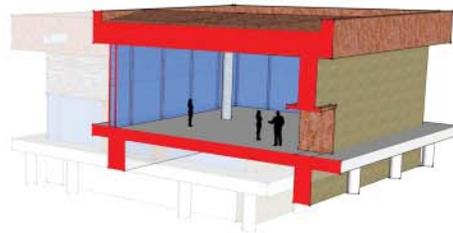
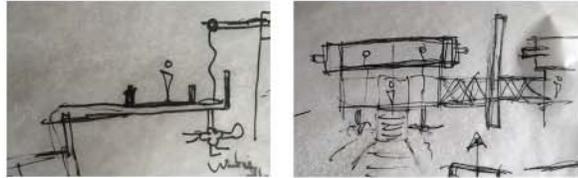
Schemes:



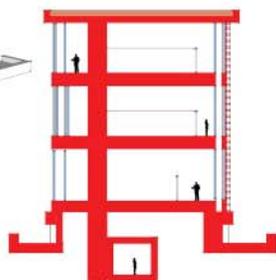
Community Connection



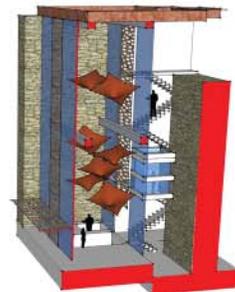
Lobby



Office



Gate

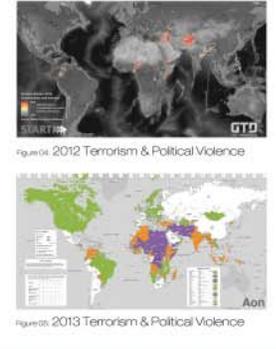
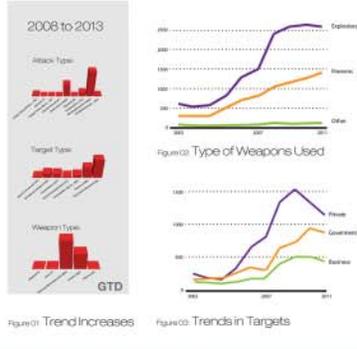


Presentation

Strength & Diplomacy:
The Architectural Tectonics of an Embassy

ISSUE:

1945	France, Cuba	US sends military aid to France to fight Germany
1947	Mexico, Iran	US sends military aid to Mexico to fight Communism
1948	India, Pakistan	US sends military aid to India and Pakistan
1949	China, Korea	China sends military aid to Korea
1950	New York, USA	China sends military aid to Korea
1951	Washington, DC, USA	Department of Defense sends military aid to Korea
1952	Alaska, Alaska	Department of Defense sends military aid to Alaska
1953	France, West Germany	US sends military aid to France and West Germany
1954	France, West Germany	US sends military aid to France and West Germany
1955	France, West Germany	US sends military aid to France and West Germany
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2017	France, West Germany	US sends military aid to France and West Germany
2018	France, West Germany	US sends military aid to France and West Germany
2019	France, West Germany	US sends military aid to France and West Germany
2020	France, West Germany	US sends military aid to France and West Germany
2021	France, West Germany	US sends military aid to France and West Germany
2022	France, West Germany	US sends military aid to France and West Germany
2023	France, West Germany	US sends military aid to France and West Germany



CONDITION:

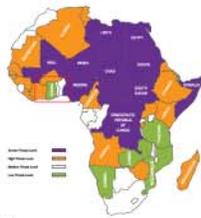


Figure 01 Africa



Figure 01 Ghana



The United States established diplomatic relations with Ghana since 1967 following Ghana's independence from the United Kingdom. The United States and Ghana share a long history promoting democracy and human rights.



Government: Unitary Presidential Constitutional Democracy
 Capital: Accra
 Official Language: English
 Legislature: Parliament
 Area: 57,000 sq. mi.
 Population: 20 million
 GDP: \$10 billion

ANALYSIS:

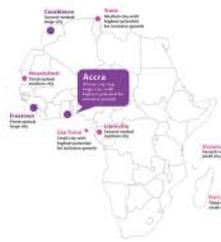


Figure 01 Africa Growth Index



Figure 01 Accra (Satellite)



Figure 01 Central Accra

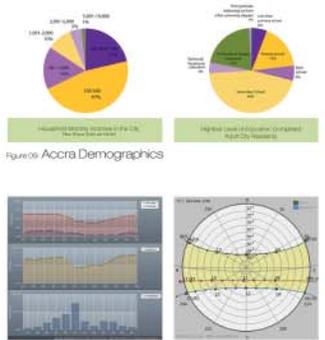


Figure 01 Accra Demographics

Figure 01 Climatic Analysis



Figure 01 Ghana (Satellite)



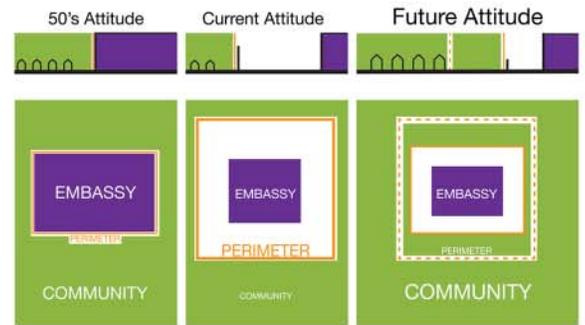
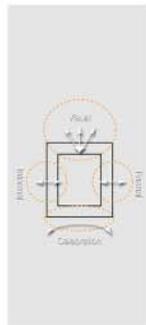
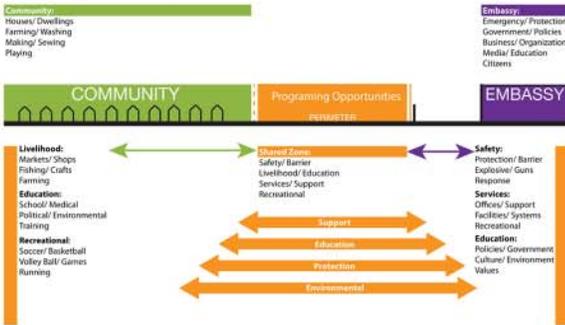
Figure 15: Current Conditions



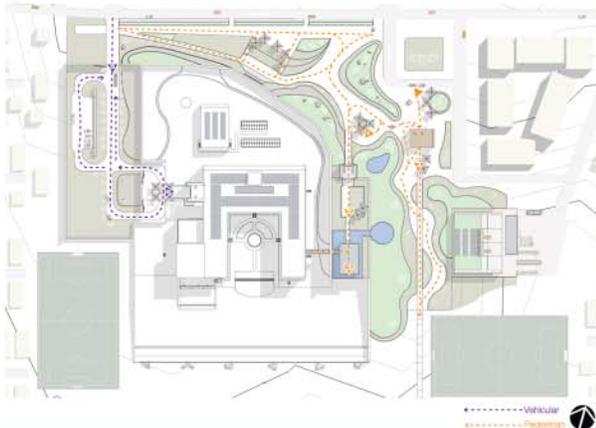
Figure 16: Master Plan



DIAGRAMS:



CIRCULATION:





Amphitheater



Tensile Shaders



Collection Ponds



Solar Panels



Service Area



Active Bollards



Community Soccer Fields



Continuous Beach



Protected Swimming Area



Habitat Breakwaters

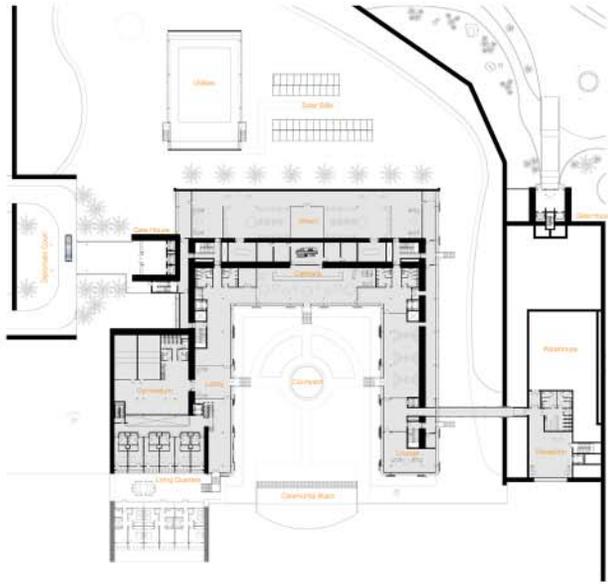


Fishing Pier

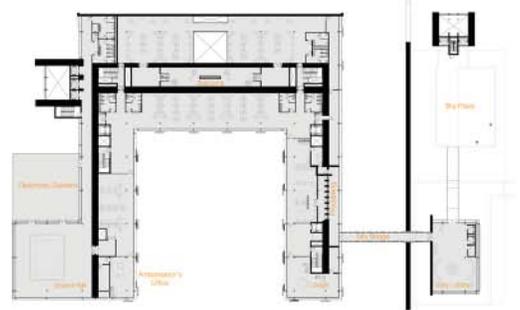
Site Plan



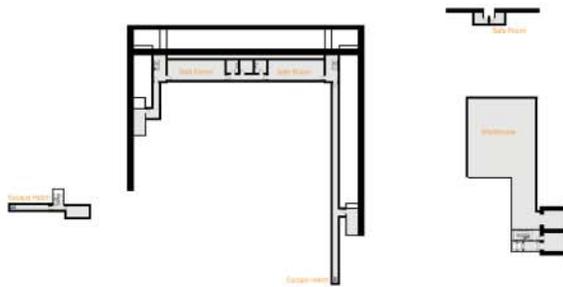
10000 FUTURE



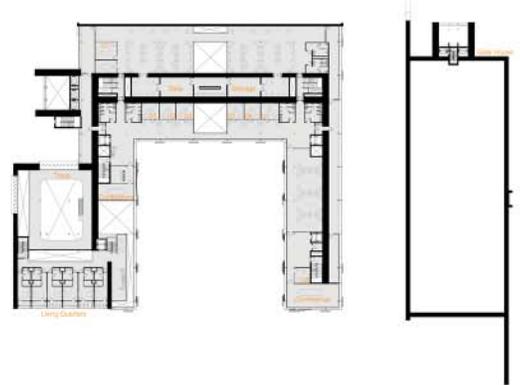
Office Level 1: v102-v117



Office Level 3: v102-v117



Safe Rooms: v102-v117



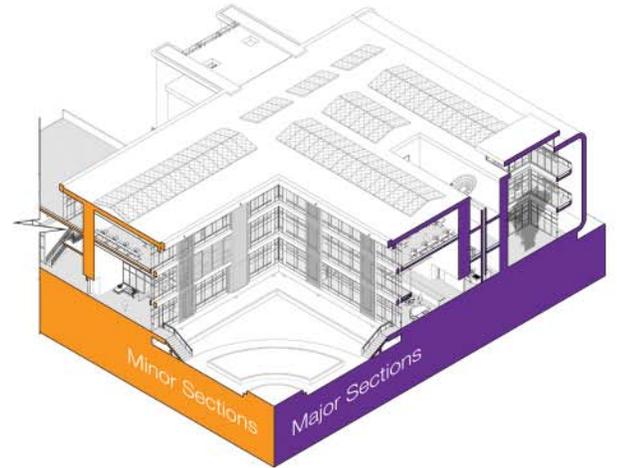
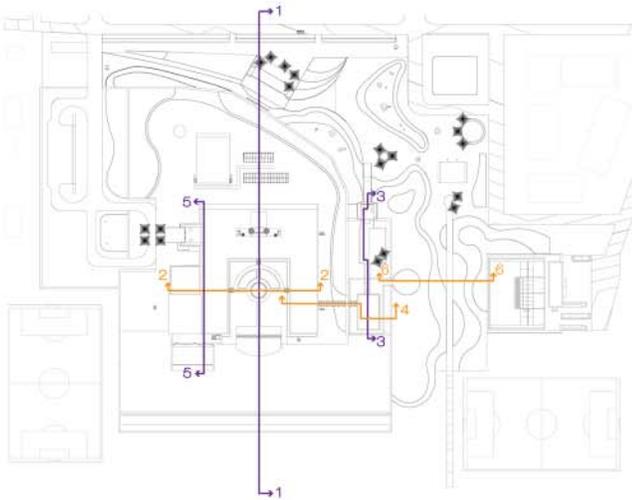
Office Level 2: v102-v117

Floor Plans

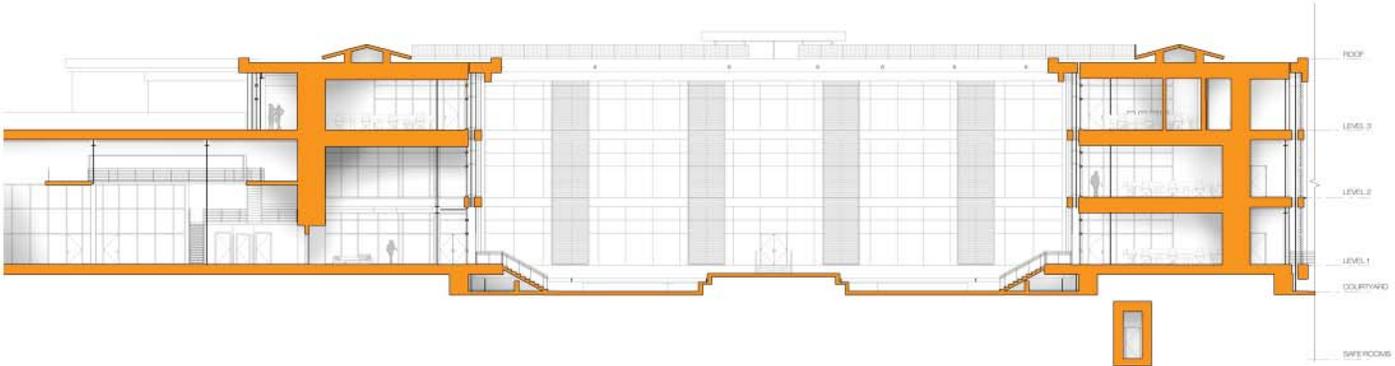


Aerial Vignettes

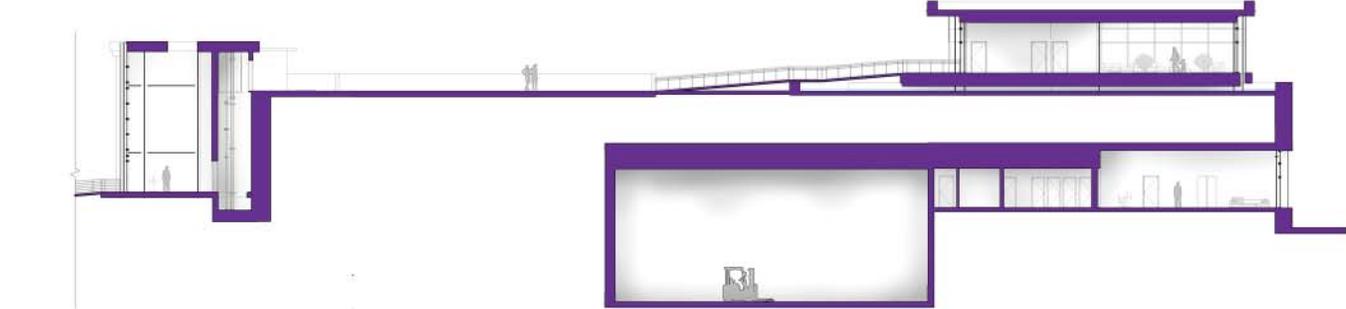




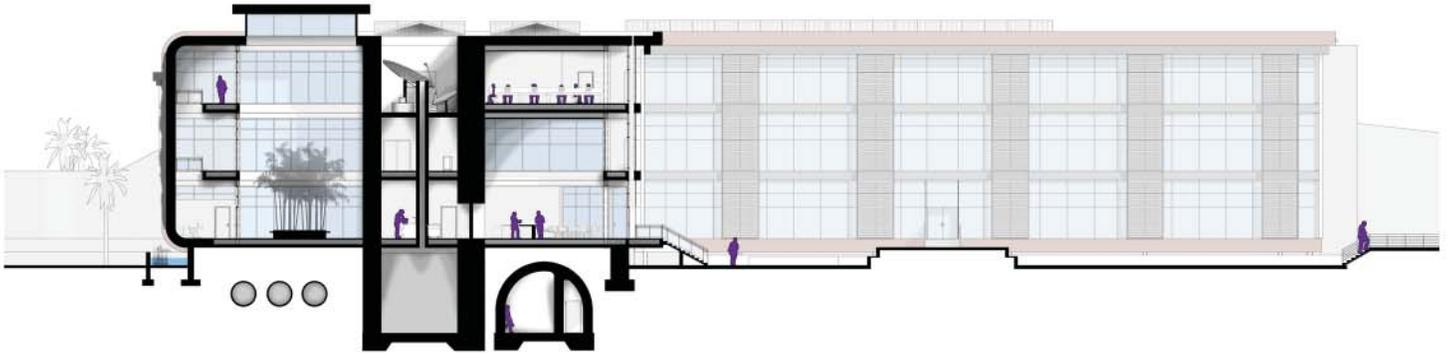
Section Key



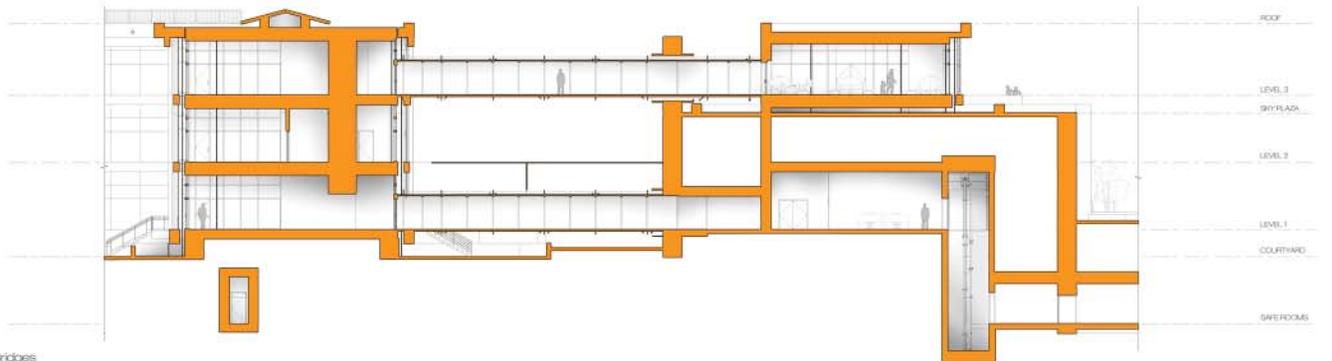
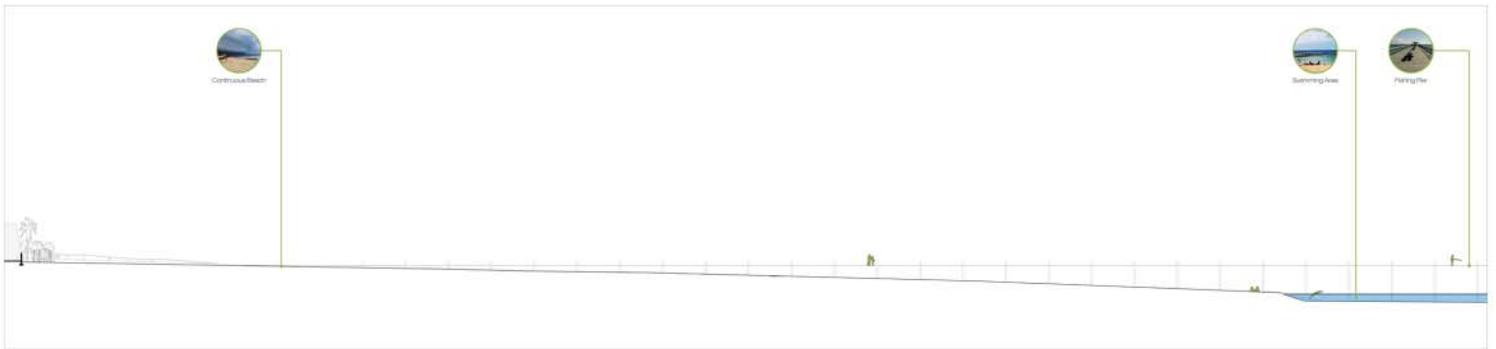
Section 2 Scale 1/8" = 1'-0"



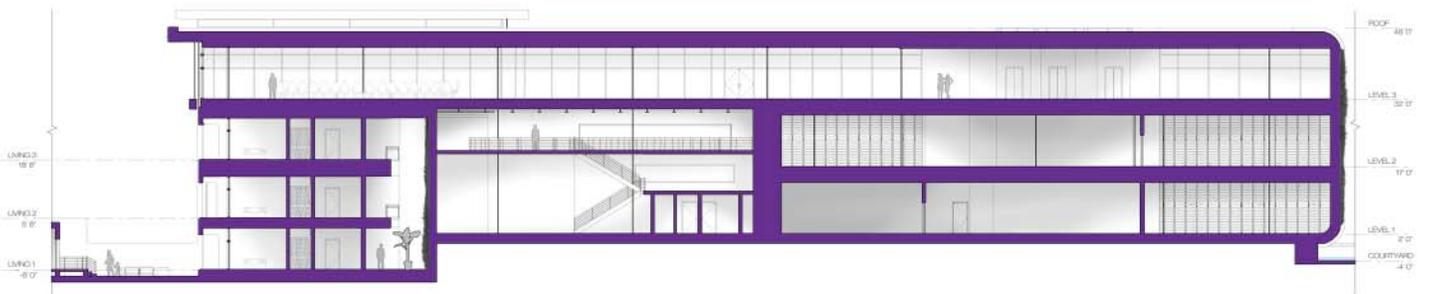
Sky Lobby Path Section 3 Scale 1/8" = 1'-0"



Section 01 Scale 1" = 10' 0"



Delicate Bridges Section 4 Scale 1/8" = 1'-0"



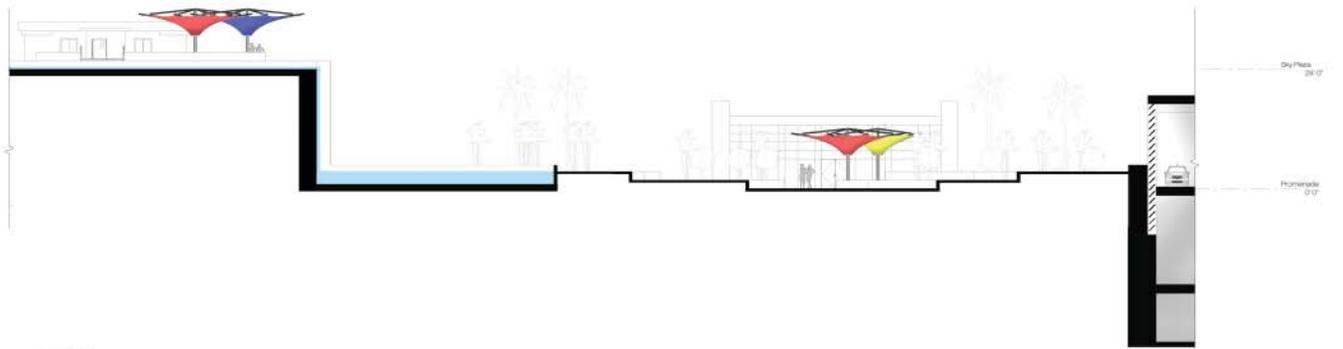
Diplomatic Path Section 5 Scale 1/8" = 1'-0"



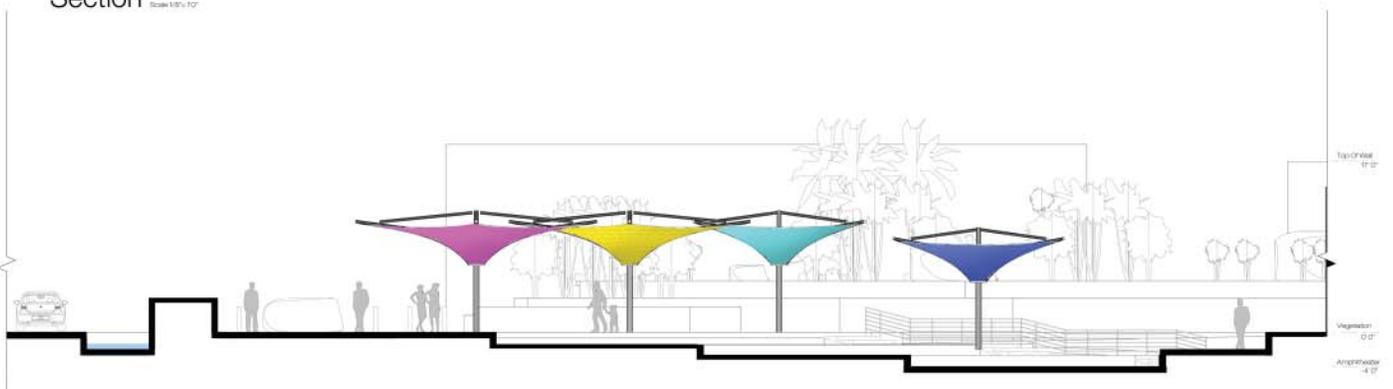
Celebration Plaza



Vehicle Drop-off



Pier Path
Section
Scale 1/8" = 1'-0"



Celebration Plaza
Section
Scale 1/8" = 1'-0"



View from Beach



View from Peir



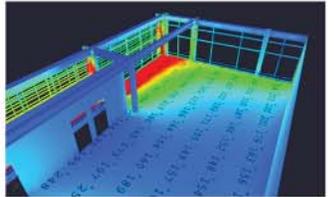
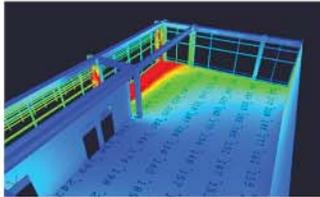
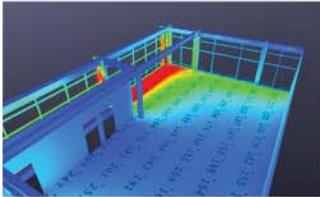
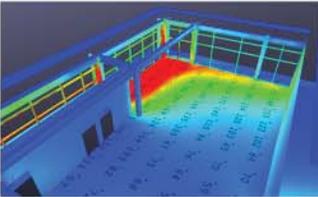
Physical Model





Courtyard

SKY LOBBY *Daylighting:*

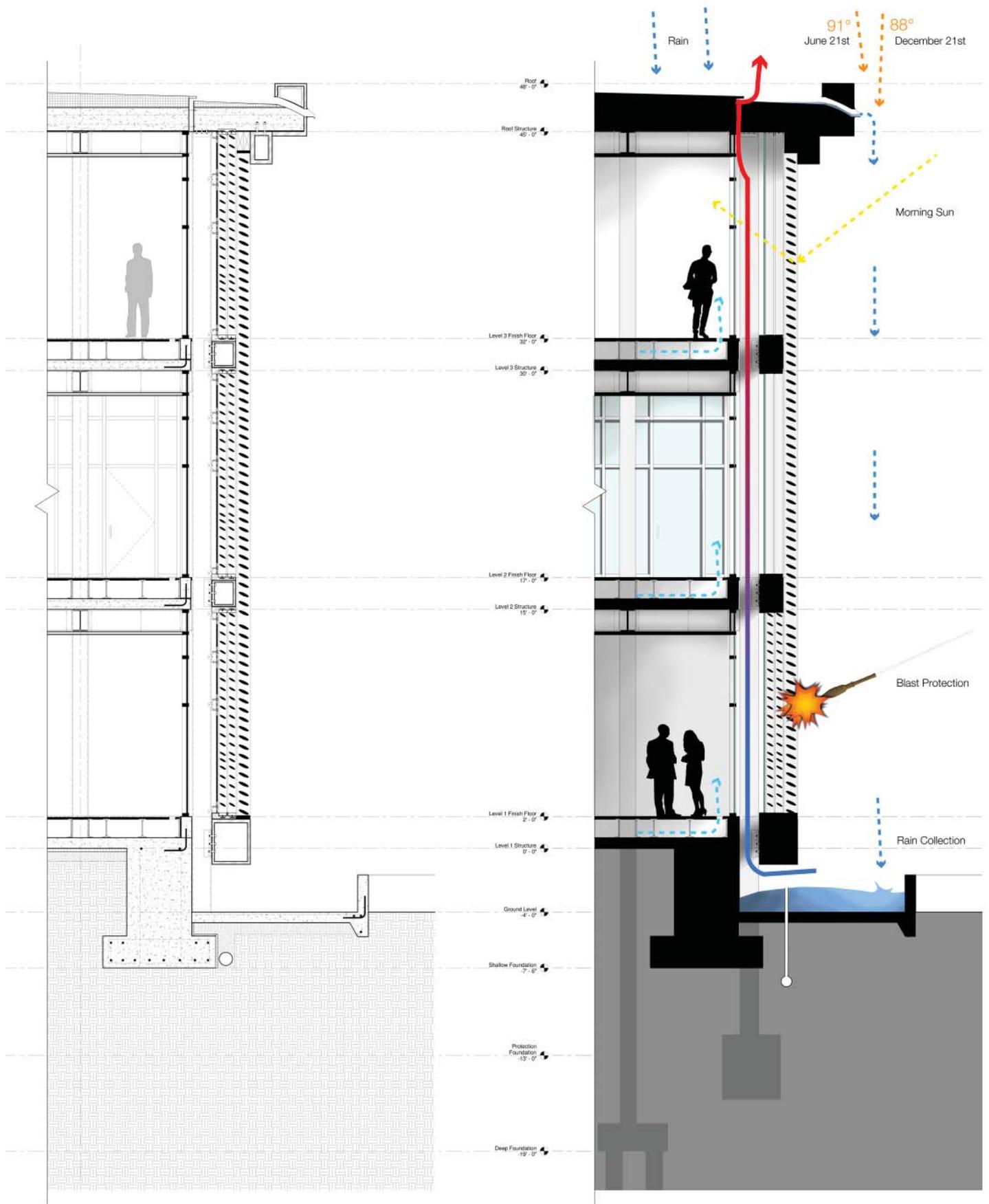


Single Skin Facade No Louvers

Double Skin Facade No Louvers

Half Panel of Louvers

Full Panel of Louvers



Wall Section Scale 1/2" = 1'-0"

Addendum

Strength & Diplomacy:
The Architectural Tectonics of an Embassy



ADDENDUM

Written/ Research

This was a tough research project, for at the time I was trying to get the information on embassy and other secure buildings. I do understand the need for confidential materials, so my efforts would have been better spend on getting to know my site and context even better. The paper ended up being a "how to" secure elements of the building. Instead I wish I focused on how to connect the surround people to the site/ place. The tricky typology of the embassy in my opinion it needs to morph to the context of each country. Embassies are no longer the symbol of strength and power, but instead symbol of our connection to each other.

Site Selection

Normally when dealing with this typology the site would be pick by the government. However I took the opportunity to pick a site that would have a greater impact on the local people. I was very difficult deal with a site that had no virtual data, beside that of Google Earth topography. I was lucky enough to visit Ghana that summer and get a understanding of the local context.

Design

Resulting from my minor secure research finds I had to infer some of security designs. I did however learn about the space and size need for some of the security measures. So, again my effort would have been better spent on exploring the connection between the site and context.

The result of my design was to tone down a build that the general population cannot interact with, and give more public space for which to interact. Instead of finding this balance of strength and openness I gave a clear division of which side of the wall is okay to engage. I do think acceptable design in this country, but I do not believe this the right solution for all embassies.

Reflection

This was a wonderful experience; I want to thank Angela Watson, guest jury, Craig Hinrichs, Sergio Sanabria and supportive members here at Miami University. My classmates have also been a wonderful support team. I will say to anyone starting this process enjoy and never stop producing work it will be over before you blink.