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Landscape as Urbanism

Ryan Nicholas Abraham

University of South Florida

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Landscape as Urbanism

by

Ryan Nicholas Abraham

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Architecture
School of Architecture and Community Design
College of Graduate Studies
University of South Florida

Major Professor: Shannon Bassett, M.AUD.
Trent Green, M.AUD.
Robert Brinkmann, Ph.D.

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Keywords: Environment, infrastructure, site, form, functional

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Dedication

This thesis is dedicated to my family in Trinidad who always believed in me and supported me throughout this journey. Special dedication goes out to my father Richard David Abraham who passed away on August 11, 2008. R.I.P dad.
Acknowledgements

I would like to extend my deepest gratitude to the following people for their guidance, encouragement and support.
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ABSTRACT

Scholars have suggested that landscape become the main ordering device in the development of the built environment. Traditional methods of urban planning have categorized landscape as a cosmetic application, the purpose of which is to beautify the urban environment after the planning and development phases. The problems associated with globalization and rapid urbanization at present includes the commoditization of urban form. As a result of this trend, many cities are becoming less and less distinguishable from one another, as urban form is generated without considering the particularities of site and context. The lack of a more specific understanding of a site in its environmental, social and cultural dimensions, has led to the phenomenon of “universal” urban form. Landscape has new found relevance in contemporary urbanism becoming the medium that defines urban form; inserting the built environment within the context of complex natural, social and cultural environments. Landscape has the potential to design relationships between dynamic environmental processes and urban form, and
In the island of Trinidad there exists the opportunity to explore the potential of landscape as a driver of urban form. The island is currently experiencing rapid urbanization and dynamic growth due to a boost in the economy, and an unprecedented government agenda to take the island to a developed nation status by the year 2020. Due to this emerging urbanity, there is the need to implement urban development approaches that protect the environmental integrity of the island, and preserve the social and cultural influences that give identity to the island.

The investigation led to the development of a landscape infrastructure that is implemented in an effort to achieve sustainable urban development and preserve the natural integrity of the site. Through an in-depth analysis of the landscape, identifying the natural, social and cultural processes occurring, a plan of intervention is developed that is integrated with the dynamics of the site, and serves as an example of the potential of landscape in urbanism.
Chapter 1 - Introduction

The intent of this thesis is to investigate ways of integrating landscape design strategies in urban planning and development, in an effort to give order to the built environment and become the driver of urban form. An objective of the investigation is to combine the culture and physical identity of the place through the integration of building and landscape, the latter of which dominates the island.

The island of Trinidad is a developing nation seeking an identity as it overcomes the influences of its colonial past. The colonial history of the island has played a significant role in the current state of its built environment. The influence of colonial architecture and urban planning by the British that colonized the island is evident in the buildings that litter the landscape. These buildings have left a strong impression that the island was forced to adopt a foreign identity. Landscape had been merely prescribed as decoration, when ironically the entire island was dominated by lush tropical vegetation. There was no physical
experience of the landscape within the built environment, it had only been preserved for a visual experience.

As the nation is beginning to overcome its post colonial mind-frame and steer away from those influences, a new generation of leaders has emerged and is attempting to bring change and a new identity to the island nation. The government has embarked on an unprecedented agenda to transform the country into a developed nation by the year 2020. Due to this agenda, the nation is experiencing dynamic growth, and as a result, a radical wave of development. This emerging urbanity is sinfully influenced by global development trends and architectural motifs resulting in a built environment that carries no identity of its locale. These types of development approaches create a disconnection between the people and their surroundings. In many cases this trend has created ‘unidentifiable places’ in the fabric of Trinidad; places that have adopted foreign architectural themes.

In order for urban development to truly impact
Trinidad in a positive way, it must consider the natural environment, and how this native context is embedded in the lives and culture of the people. This project hopes to be an example of a new approach for sustainable urban development in Trinidad; environmentally, socially and culturally. The project will attempt to integrate landscape planning and design strategies with urban design, and explore their marriage with the culture of Trinidad. Urban design is not intended to be the primary focus of this thesis. However, it serves as the catalyst for the exploration of using landscape to solve urban design shortcomings and create a new identity for the built environment of Trinidad.

Scholars have suggested that landscape be the main ordering device rather than just decoration in the development of the built environment. It is seen as a critical element in achieving sustainable growth of towns and cities. Architect and Urban Designer Rem Koolhaas states: “Architecture is no longer the primary element of urban order; increasingly urban order is given by a thin horizontal vegetal plane;
increasingly landscape is the primary element of urban order.”

The use of landscape as a medium to connect detached areas of a city and also to create pleasant public spaces has been successfully addressed in several built examples around the world. However, these two examples of the use of landscape merely scratch the surface of the potential of landscape; they barely go beyond the use of landscape as a connector and as decoration. The potential of landscape is far greater than that; the landscape can play a deeper role in sustaining the culture and identity of a place, as the culture of a people can be realized in the way that they shape their environment. The natural environment of a place leaves an unconscious impression in the memory of the human spirit, and this memory can carry an identity with it. Kenneth Frampton States: “The character of a place resides in its natural features”.

Reinterpreting the role of landscape in the fabric of Trinidad, is crucial in determining ways to achieve sustainable growth, without the total
destruction of the natural environment. In a place like Trinidad that is dominated by lush tropical vegetation, it is only appropriate to pay close attention to the landscape as a hierarchal element in any urban design project. Many authors have made claims for the potential of landscape in urban design, as architect and educator Stan Allen stated: “Increasingly, landscape is emerging as a model for urbanism. Landscape has traditionally been defined as the art of organizing horizontal surfaces.... By paying close attention to these surface conditions, not only configuration, but also materiality and performance, designers can activate space and produce effects without the weighty apparatus of traditional space making.”

The intent of this investigation is to be specific to the case in Trinidad, and not only understand landscape in urban design issues but gain an understanding of landscape influences on culture and cultural influences on landscape. The issue of culture of how it can influence design is critical to this investigation. The culture of a place, together with the natural landscape of that place

Fig.6 Trinidad Landscape. Photo taken by Ryan Abraham
can form a resistance to the commoditization of architecture and urban form. This is the case in Trinidad at present where global influences of design are resulting in architecture and urban form that is insensitive to its locale. This leads to the second aspect of the theoretical framework that will be the basis for this thesis investigation; Critical Regionalism. Kenneth Frampton stated; “The understanding of the particularity and distinction of different local and regional landscapes can provide a resistance to the homogenizing effects of globalization.”

The fundamental aspect of critical regionalism is to mediate the impact of universal civilization with elements derived indirectly from the peculiarities of a particular place. For Trinidad to gain an identity through design, understanding the site and bringing out the best qualities of the landscape is important. One of the main features of the landscape there is the irregular topography which is covered with lush tropical vegetation. The natural landscape has had a tremendous impact on the lives of the people of Trinidad in that they
identify with the sloped terrain and the society has evolved around this natural landscape.

A critical regionalist approach is necessary to prevent the influence of globalization on the island in which the landscape is being transformed dramatically to accommodate buildings whereas it should be the other way around where the building accommodates the existing landscape. Kenneth Frampton states: “The bulldozing of an irregular topography into a flat site is clearly a technocratic gesture which aspires to a condition of absolute placelessness; whereas the terracing of the same site to receive the stepped form of a building is an engagement in the art of ‘cultivating the site’.”
Chapter 2 - Case Studies

Case studies were carried out on selected landscape and urban design projects that met specific criteria in relation to the scope of this thesis investigation. Projects were selected based on the following criteria; (1) Integration of building and landscape. (2) Balance between preservation and intervention. (3) Blending of natural landscape and designed landscape. (4) Sustainable and innovative approaches to urban design. (5) Projects that address culture and identity through design. Each case study had some influence on the design project.
City of Culture of Galicia
Santiago de Compostela, Spain
Eisenman Architects

The City of Culture is a new Cultural Center for the Province of Galicia, in northern Spain. The design of the center is the result of a superimposition of three sets of information. The street grid of the medieval city center of Galicia is overlaid over the topographic map of the hillside site. Then a modern Cartesian grid is laid over these medieval routes to create a combined grid. Then the architect used computer software to distort the two dimensional grid into a three dimensional form. The urban form is a result of the superimposition of the site’s natural, historic and modern conditions. The cultural center becomes one with the landscape and creates a strong sense of place. The project consists of six buildings, each with a separate program. However, they were conceived as three pairs of buildings and
the experience of each building is affected by the relationship of the adjacent building. The overall form is broken up by pedestrian streets that wind between the buildings and open up onto public plazas. Some of the rooftops of the buildings become habitable spaces in which visitors can walk. The structure of the buildings is made up of two separate systems. The inner structure which comprises of the floor slabs is made of poured in place concrete, and the outer structure which is the building envelope and roof is a carefully designed steel structure with glass curtain walls. This type of hybrid structural system allows for the manipulation of form without sacrificing the interior spatial quality and functionality. The project exemplifies an innovative approach to urban design using the landscape and as a driver of form.
**Fresh Kills Landfill Park Project**  
*Staten Island, New York*  
*Field Operations*

The Fresh Kills park project which covers 2,200 acres is one of the largest public park projects in the world. The project is focused on transforming the Fresh Kills Landfill into a public park and is planned in four phases that will take thirty years until completion. The major focus of the project is to transform the landfill into an ecologically diverse and culturally active park. The program includes various forms of social, cultural and recreational activities. The Master Plan for the park is a framework that consists of three distinct systems; new habitat, new activities, and Circulation systems.

The project is composed of a series of layers within each system that will evolve overtime in four phases. (1) Seeding - the introduction of new plant communities and rejuvenation of natural habitat. (2)Infrastructure – the development of the natural landscape infrastructure and the implementation of
other man made infrastructure to ensure a functionally efficient landscape. (3) Programming - the development of various cultural and recreational activities including nature trails, horseback riding, mountain biking, community events, outdoor dining, sports fields and canoeing.

(4) Adaptation – The continued maintenance and modification of the various roads, pathways, surfaces, ecosystems and programs overtime.

The Fresh Kills Park Project is an initiative that involves many different groups of people; the local government, local residents, ecologists, landscape architects and urban planners, as well as many others that will be involved in the different phases. This project serves as an example of sustainable landscape and urban planning that is aimed at healing and reinventing brown field sites and restoring a balance between man and nature.
Rebstockpark Master Plan
Frankfurt, Germany
Eisenman Architects

The Rebstockpark Master Plan was proposed in 1991 by architect Peter Eisenman and landscape architect Laurie Olin. The project is conceived as an urban landscape of housing, offices, commercial space and a large urban park. The designers’ intention was to explore potential relationships between the ‘city and nature’ in an effort to build sustainable relationships with the environment while at the same time creating viable social spaces.

Much of the designers’ interest was in the land and exploring the potential of “site” and its engagement with city planning through the design process. Instead of the figure/ground relationship of traditional urban planning, the designers propose a new concept of a city/nature dialogue. This dialogue is expressed through an interweaving of the urban elements of shops, offices, housing and parking, with the elements drawn from the
surrounding agricultural landscape of meadows, woodlands, irrigation ditches and canals.

The result of this interweaving of urban elements and nature is the creation of a place within the city that has characteristics of both. This type of condition explores the potential of new relationships between people’s daily life and the natural environment. Eisenman refers to the site weave as developing a surface that doubles as a topological event and as a structure that simultaneously disappears and resurfaces.

This project is a great example of the relationship between landscape and urbanism, through the exploration of site conditions and urban form.
**Tanghe River Park**

*Qinhuangdao City, Hebei Province, China*

*Kongjian Yu*

The Tanghe River Park project was aimed at protecting the ecological integrity of the site while at the same time allowing access to the park. The problem of flood and storm water management was addressed by recovering wetlands at the river’s edge, which allows for the seasonal rise in tidal flows. These wetlands also create new habitat for wildlife. This approach re-creates a natural setting in the heart of the city which serves as an example a sustainable approach to urban design.

The work of Chinese landscape architect Kongjian Yu can serve as an example of landscape strategies that can be integrated into urban planning. The educator and designer has executed numerous projects in his native country that have been successfully integrated with the natural environment, taking a minimalistic approach to site intervention and allowing the natural processes to
continue uninterrupted. His projects promote interaction between the people and their land; they retrieve a sense of place and create lively public spaces. Professor Yu speaks of his work as a way of educating the public about “green” solutions. Kongjian Yu states in his writings that the first problem is that landscape architecture is too associated with the tradition of gardening, and it should be taking a more important role in environmental issues. Some of the environmental issues that he addresses are flood control and water management which are pressing issues in his native China. He states that Landscape architecture also has a role in sustaining cultural heritage and the identity of a people. The loss of cultural identity is a major issue facing some developing countries due to rapid globalization. “The profession must re-evaluate the vernacular of the land and the people, and lead the way in urban development by planning and designing an infrastructure of both landscape and ecology, through which landscape can be created and preserved as a medium, and as the connecting link between the land, the people.
His aim is to create a consciousness about the beauty of the natural landscape and its diverse vegetation. He aims to rejuvenate a land that sustains humanity and return the identity of the people and their place. He says that landscape architects and planners should lead the way in urban development by identifying and designing a landscape infrastructure, which is critical in safeguarding the ecological processes and the cultural traditions that give us our identity. This landscape infrastructure should be created before the development plan evolves. “Landscape architecture must take the opportunity to play a key role in building a new society of urbanized, global, and interconnected people.” (Yu, 11).

This project and the overall philosophy and design approach of Kongjian Yu is a great precedent for ecologically sustainable landscape and urban planning. His work strikes a balance between environmental protection and social rejuvenation in his many urban parks. His theory to landscape planning is that less is more; less intervention, more rejuvenation.
Chapter 3 – Trinidad and Tobago

Trinidad and Tobago is a twin island nation situated in the southern Caribbean Sea, 10 degrees north of the equator and approximately 7 miles off the northeastern coast of Venezuela. The thesis investigation was focused mainly in Trinidad, the larger of the twin islands. The two islands together cover approximately 1,979 square miles, with Trinidad, the larger of the two comprising about 94% of the total area. The population of Trinidad and Tobago is approximately 1.3 million inhabitants, with 95% of the population living in Trinidad.
History

Trinidad and Tobago was discovered in 1498 by Christopher Columbus on his third voyage to the new world. The Spanish settled in the island a century later wiping out most of the original inhabitants. The original inhabitants of the islands were the Arawak and Carib Indians. It is said that Columbus named the island Trinidad after the Holy Trinity, which was due to his first sighting of the island and its three large mountains in the southern range ideally named the Trinity Hills today. The Spanish colonized the island and mainly used it as a base; for the main intent of the Spanish was to eventually reach El Dorado, the city of gold. However, the colonization of the islands by the Spanish can be seen mostly by the names of streets and towns today; for example, Port of Spain, the nation’s capital still today, and Diego Martin, the town in which the project site is located.

For two centuries after the Spanish settled in Trinidad, the island passed back and forth between
the Spanish, the French and the British who fought to gain control of the twin island nation. Eventually in 1797, the Spanish surrendered the island to the British who were under the rule of Sir Ralph Abercromby. The British settled in the island and began to develop numerous sugarcane plantations throughout the entire land, mainly in the low lying plains of the central part of the island. Trinidad became a major port of export for sugarcane and other agricultural products such as cocoa. The ongoing slave trade provided thousands of slaves to work these sugar plantations and the number steadily increased as more and more French and British slave owners came to Trinidad for the prosperous sugarcane industry. By the year 1803, a British consensus estimated the population to be 28,000 inhabitants. Half of that number spoke French while the other half was divided between Spanish and English speakers. The native Amerindian population continued to decline with the majority of these natives scattered in rural settlements.
A decade after the abolition of the slave trade in 1834, the British Government gave permission to plantation owners to import indentured laborers from India to work on their plantations. Over the next few decades in the history of Trinidad, the population steadily increased, but this increase of immigrants were mainly indentured Indian laborers. By the year 1871, about 25% of the population was made up of East Indians. During this time, small numbers of Portuguese, Chinese and other groups including Lebanese also immigrated to the island to take advantage of the agricultural trade. The turn of the century brought with it a decline in the sugar industry as sugar was being produced cheaper elsewhere.

The British ruled Trinidad and Tobago as a Crown Colony up until the year 1956 when the islands with the assistance of the British began to develop strategies for self governance. In the year 1962, Trinidad and Tobago gained its independence from the British and officially became the Republic of Trinidad and Tobago.
Culture

The culture of Trinidad and Tobago reflects the history of the islands and the influence of Amerindian, Spanish, French, British, African, Indian, Chinese, Portuguese, Venezuelan and other immigrants that brought their respective cultures with them to the islands. Trinidad being a British Colony was left with a strong influence of the British mainly; the English language, the system of government and the two most popular sports played in the islands, football and cricket. One of the most influential aspects of the culture of Trinidad is that of Carnival that was brought there by the French settlers in the late eighteenth century. Trinidadians or ‘Trinis’ as they refer to themselves enjoy partying anytime there is the opportunity. The local word for party is ‘fete’ which was also brought there by the French.

The music of Trinidad and Tobago is mainly soca and calypso and a huge part of the culture is playing and listening to ‘steel pan’ or steel drums which were originally invented in Trinidad.
However, during the Christmas season in Trinidad there is a special type of music that is played and enjoyed throughout the entire island, and that is ‘parang’. Parang was brought to the island by the neighboring South American country Venezuela and has been modified to suit the culture and language of the people in Trinidad over the years. However, in some parts of the country there still exist Spanish speakers who continue the original tradition of parang.

A very telling aspect of the history of the island is the traditions still practiced by the large East Indian population. Historically, the East Indians came to Trinidad on their own free will as indentured laborers and therefore they kept their culture and traditions unlike the Afrotrinidadians whose descendants were brought as slaves, essentially stripped of their culture. The East Indians celebrate many of their religious traditions annually in Trinidad including Divali, Hosay, and Phagwah. The East Indians also play, sing and dance to their music called Chutney. The cuisine in Trinidad can be described as a blend of
Amerindian, European, African, Creole, Chinese, Indian and Lebanese. The cuisine is indicative of the varied origins of its people.

However, over the many years of coexisting in the island nation, the many different peoples of various ethnicities and backgrounds have somewhat blended with each other and they all say that they are proud “trinis”. The culture of Trinidad cannot be described by secular aspects but can only be described as a rich blend of ethnicities and influences that have come together in the “melting pot” island of Trinidad to create one very dynamic and diverse culture. There is certainly a little bit of every part of the history of the island present today in the culture of Trinidad.
Landscape

The landscape of Trinidad and Tobago can be characterized by steep mountains, undulating hills and plains. Trinidad and Tobago is the most southerly of the Caribbean chain of islands and is located just off the coast of the South American mainland. The island is comprised of some of the most productive and diverse ecosystems in the Caribbean. The landscape of the island is made up of tropical rainforests, abundant rivers and streams, fertile flood plains and swamps. The island of Trinidad is blessed with a very rich natural environment, and shares most of its variations of flora and fauna with the South American mainland. Trinidad features three distinct mountain ranges; the northern range extends across the entire north part of the island from east to west. The central range is the smallest of the three and then there is the southern range. Undulating lands, plains and swamps separate these ranges from each other. Due to the vibrant ecosystems in the natural landscape in Trinidad, the island is host to
hundreds of species of mammals, birds, reptiles, amphibians and invertebrates. Resulting from its close proximity to the South American mainland, Trinidad and Tobago has a high species to area ratio. The islands have over 2,200 species of flowering plants, 110 of which are endemic to the island, including numerous types of palms. The landscape dominates most of the island and the people of Trinidad have adapted to life in such a rich and diverse landscape.

The thesis investigation will attempt to uncover ways of integrating this natural environment in a more sustainable manner with urban planning and development.
Chapter 4 – Project Site

Site Selection

Throughout the island of Trinidad there are many areas that are virtually untouched, where diverse ecosystems thrive and the threat of ecological destruction is nonexistent. However, there is a huge demand for land by developers mainly in areas in and around the capital city of Port of Spain and its environs. Most of these areas that are within a 20 mile radius of Port of Spain have already been developed except for a few parks and open spaces that were a part of the city planning done by the British. Unfortunately, the demand for land in and around these environs is resulting in a total destruction of any remaining natural landscape in replace for concrete and steel structures. The natural landscape of Trinidad is slowly disappearing in areas of high human density and transforming parts of the island into “concrete jungles”. The selection of the site is based on certain criteria in an effort to align it with the intent of the thesis investigation. The criteria for site selection are: (1) The site cannot be a rural site, but it has to be within an urban context. (2) The site must provide challenges, both for preservation and intervention. (3) The site must be an existing open space, not under development. (4) The site must be at such a scale so as for the project to
have a substantial impact on the surrounding areas. The selection of a site that meets these criteria is crucial in order for the thesis investigation to be successful, and potentially prove that integrating urban development with the existing landscape can result in naturally, socially and culturally sustainable environments.

After considering numerous sites within a 20 mile radius of Port of Spain, a final site was selected that met the criteria. The site is located in the northwestern peninsula of the island. (See Fig. 45) The site is located at the mouth of the Diego Martin valley. The Diego Martin valley is one of the larger and more densely populated areas west of Port of Spain. This region is quickly becoming one of the prime areas for development in the island, and the site is one of only a few undeveloped sites left that are susceptible to development in the near future. An aerial view of the site at the macro scale is shown in fig.46. As shown in the image, this valley is densely populated and the only areas that are not inhabited are the areas on the mountains that are inaccessible or too steep to build on. The mountainous terrain of the northern range is evident in the image. The site sits somewhat directly in the middle of the valley.
The image to the left (fig.47) shows the site at an intermediate scale. It is important to view the site at varying scales in order to get a full understanding of its location and setting.

The image shows the adjacency of the site to the Diego Martin River. The image also shows the way that the ridge to the right of the sight is currently being cut away in order to accommodate some development. This is a prime example of the destruction of the natural environment in the face of rapid urbanization in Trinidad.
Site Analysis

A series of diagrams begin to filter the site information and breakdown the site into its many layers in order for a thorough understanding of the site to be gained. The thesis investigation requires an in-depth site analysis in order for a suitable plan of intervention to be made. The image to the left (Fig.49) shows the figure/ground of the site area with the main arterial road network in red and the secondary road network in yellow. One can see the way in which the topography dictated where development could occur and where it could not. The site sits at a critical place in the middle of this figure/ground of buildings and the road/street network. This gives the site a lot of potential but at the same time creates a lot of challenges.
Historically, this area at the mouth of the valley where the site is located today was once at the edge of mangrove swamp which dominated this part of the coastline. The site was surrounded by the Diego Martin River on the west side, the foothills of the northern range on the east side and the mangrove to the south side.

In the 1950’s when Diego Martin began to develop more and land began to become a commodity, the mangrove was destroyed and the swamp was filled in and reclaimed as land for development. This area being on the flood plain had rich, well irrigated soil well suited for farming. In the 1950’s on until about the mid 1970’s the site was occupied as farmland and that is the reason why there was never any internal circulation network laid down.
The surrounding context around the site is made up of mainly residential development. To the south of the site there is a regional mall and some other retail which act as an activity hub in this area. This activity hub coupled with the residential density mean that the around the site there is a considerable amount of vehicular traffic. To the south eastern edge of the site is a major intersection where a lot of pick up and drop off in the form of pedestrians using public transport occurs.

The diagram to the left (Fig.54) shows the introverted nature of the surrounding residential developments. These residential neighborhoods turn their backs to the site partly because of the time they were planned and built; the site was functioning as farmland. However, today the site is unoccupied and the situation remains the same. This provides an opportunity for the site to become a connector of these introverted neighborhoods. The location of the site at the intersection of the two major arteries in the region, also give the site the opportunity to become a landmark.
The site exits as the last open green space in the region and this is a very important feature. The high demand for land for development in this region of the island means that this site will eventually become developed and may end up looking like one of the surrounding neighborhoods. If this happens, there will never be any interconnectedness within these separate developments and a great opportunity would have been lost. The site proves to be a great location for the thesis investigation to be carried out and implemented.

From an urban planning point of view, there lies an opportunity for this site to be the connector of the surrounding communities and recreate a sense of place within this region.
The Abiotic analysis of the site revealed firstly that a portion of the site sits in the flood plain and so this must be taken into consideration when developing a plan of intervention. Secondly, because of the impervious road surfaces that borders the site to the east and south, and the sloping topography, all storm water runoff flows directly into the site. This is important to consider that these edges of the site remain porous in order to receive this runoff and deal with it appropriately to prevent flooding.

The biotic analysis looked at the existing vegetation on site and determined where there may be existing ecosystems. This analysis examined potential green corridors that could exist and be preserved.
As mentioned earlier, the site is bordered on the east and south sides by the Diego Martin Main Road and the Western Main Road respectively. The vehicular traffic on these roads is fairly quick and therefore that puts constraints on the number and location of access points into the site. After analyzing these conditions, the only solution was to limit the number of access points to two points. The first being along the Western Main Road at the existing traffic signal that coordinates traffic between this road and Columbus drive which goes south into the residential neighborhood and to the shopping mall. The other access point would be on the east side of the site along the Diego Martin Main Road closer to the northern site boundary, allowing enough room for vehicles merging onto this road from the Western Main Road.

All the layers of information of the site were carefully analyzed separately and together in order for a deep understanding of the forces in and around the site to be gained. A suitability diagram was created, mapping the areas of the site that were best suited for specific program. After this analysis was complete, further analysis was carried out through an overseas site visit to Trinidad. Numerous photographs were taken on this visit and some of the more informative ones have been placed on the following pages.
Fig. 61 Site Photo 1, view of river on western site boundary.

Fig. 62 Site Photo 2, local squatter currently occupying site.

Fig. 63 Site Photo 3, view of site looking northeast.

Fig. 64 Site Photo 4, view looking west along Western Main Road.
Fig.65 Site Photo 5, view of site looking northwest.

Fig.66 Site Photo 6, view of development to the east of site.

Fig.67 Site Photo 7, view of Diego Martin Main Road looking south.

Fig.68 Site Photo 8, view of Diego Martin Main Road looking north.
After visiting the site, a deeper understanding of the existing conditions was gained. The site analysis before the site visit and after the visit helped to reinforce the opportunities that the site presented and the challenges as well. One of the main issues that was reinforced by the visit was the fact that the site existed in isolation, cut off from the surrounding context by the major roads. This helped to justify the decisions that were made in the next phase of development which was the programming aspect of the project; deciding what mix of functions would relate best with the existing conditions and context, as well as be aligned with the scope of the thesis investigation.
Chapter 5 – Programming

The intent of the project program is twofold. The first objective is to preserve as much of the natural landscape as possible, and rejuvenate existing ecosystems by creating new habitat. A large part of the site will be dedicated to creating an eco-park. The second objective is to complement the existing context and to introduce new programs into the context that are needed. The existing context is primarily residential development with a retail hub to the southeast of the site along the Western Main Road. This retail hub consists of a regional mall, a large grocery store and two fast food outlets. To the south of the site there are some institutional buildings that contain some private offices and a private school. (See Fig. 72) In this diagram, yellow represents residential, red represents retail or commercial, and blue represents institutional. The proposed project program will consist of a mixture of different functions.

The project will be a mixed use development. Fig. 73 illustrates conceptually how the new program will relate to the surrounding context. The most suitable placement of the new functions are directly influenced by the program forces around the site. Any new residential development is best suited to the northern part of
the site adjacent to the residential neighborhood. New commercial activities are best suited to the southeast part of the site adjacent to the retail hub that exists across the main road. Creating a physical pedestrian connection to the adjacent mall is a possibility.

Placing a mixed use development on this site is very appropriate for a number of reasons. (1) The site sits in the middle of three residential developments, and that means that it has the opportunity to become a town-center type of urban model, that provides essential amenities to these residents as well as create new activities and attractions. (2) The site exists somewhat as a landmark as it sits at the intersection of the two main arteries in this part of the island. Every single person that lives north and west of this intersection has to pass the site every day. (3) The shopping mall that sits just south of the site across the western main road is a high activity area meaning that a new mixed use development will only complement this and create more of a vibrant regional destination.

Another observation that was made while visiting the site was that this intersection was an informal transit hub. There were always people waiting for public transport on the side of the road to go north into Diego Martin, east into Port of Spain, or west into Carenage. That influenced the decision to incorporate a formal transit station into
the program. As stated previously in the chapter, the site exists as the last open green space in this entire part of the island, and preserving this green space became one of the main goals while at the same time introducing the new program. The challenge of the design scheme will be to create a balance between open park space and enclosed program space. A decision was made to incorporate a range of civic buildings into the new program in an effort to make the development become more of a large civic space rather than just a town center. This decision was justified by a lack of civic buildings in the island especially in this region. The civic importance lies in the attention to rejuvenating the landscape while at the same time implementing new program. This balance between man and nature has to become the role of civic spaces throughout the island, as a way of creating a new identity for this developing nation. This is what this project will attempt to exemplify.

The conceptual program is as follows:

- Large Urban Park and Ecological Corridor
- National Museum of Culture
- Diego Martin Regional Library/Bookstore
- Diego Martin Administrative Headquarters
- Cafe
- Transit Station
- Retail outlets
- Residential Apartments
- Community Center
Chapter 6 – Schematic Design

Landscape Infrastructure at the Macro Scale

As stated in the previous chapter, the first objective of the proposed intervention is to rejuvenate the landscape to create a large urban eco-park. Since the site existed as the last open green space in this valley, it also was the last opportunity to create an ecological corridor that connected to the two mountain ranges. Wildlife corridors that previously existed have been destroyed as more and more development occurred in this valley. Re-establishing a wildlife corridor is critical for the survival of many species of animals that call these mountain ranges their home. Creating access to the river as a source of water is essential to rejuvenating wildlife; water is the source of life.
Fig. 76 Landscape Infrastructure at macro scale
Fig. 7. Site plan showing green corridor.
The Concept was to raise the green carpet of the site and place the new programs below. All enclosed buildings will have green roofs thus preserving the perspective of the site today; an open green space.
Landscape Infrastructure at the Micro Scale

The Concept for the site was to make the site function as a large swale, where the site sloped down toward the center. Making the site function as a swale would allow all surface runoff and storm water to flow away from the buildings thus preventing any flooding of the streets and interior programmed space. An artificial water channel that winds through the site serves as a catchment area for all storm water, as well as it creates natural habitat that promotes ecological rejuvenation. All storm water on and off the site can be directed toward this channel thus preventing flooding of the surrounding areas. This system serves as a natural landscape infrastructure that is functional and minimizes the cost of traditional storm water infrastructure. This infrastructure not only serves this development but it serves the surrounding areas as well.
Fig. 80 View of overall scheme from southwest.

The landscape is allowed to flow continuously throughout the entire scheme. The urban form is driven by the landscape.
Fig. 81 Rendered Site Plan.

The site plan shows layout of the site and the relationships of the programmed spaces to each other.
Fig. 82 Site Sections

The top section cuts through the site from west to east. The bottom section cuts through the site from north to south.
The top section cuts through the Retail Strip and Office Building (east to west). The bottom section cuts through the Taxi Stand, the Retail Strip and the Library/Bookstore (south to north).
The final model shows the continuity in urban form and the green fingers that extend through the site and into the areas north and south of the site. These green fingers serve as pedestrian connections and make a very strong urban gesture.
Fig. 85 View of overall scheme from SE
Fig. 86 View of Main Civic Space
Fig. 87 View down Retail Strip
Fig. 88 View between Office Buildings
Fig. 89 View of Café and Taxi Stand
Fig. 90 View of Retail Area
Fig. 91 Final Model 1
Conclusion

The thesis investigation was a long and difficult journey over the last year. It began with my interest in integrating the different practices of Landscape Architecture, Architecture and Urban Design. I have always felt that Architecture should always be in harmony with the landscape, it is the ground in which we build upon. I believe that this notion should go way beyond a technical standpoint and into the realm of poetic expression. For every landscape has its own character and quality. We as Architects and Urban Planners have the responsibility of initiating that engagement through design. As I learned more and more about the benefits of this type of engagement from an environmental sustainability standpoint, I realized to myself how important of a role this can play in promoting social and cultural awareness to the environment. The most intriguing aspect of the investigation to me is the fact that these types of projects need the participation of not only architects and urban designers, but also landscape architects, ecologists, geologists, engineers and the people. When all of these parties come together to work towards one specific goal, no doubt it will be difficult, but the end result will benefit not only the human society but the environment and that is the true victor. Sustainability is a key issue in all fields of study and practice and it is time for us architects
to lead by example and initiate these types of projects.

This thesis investigation culminated with the design scheme put forth. The scheme attempted to develop a landscape infrastructure that functioned at different scales. The overall architectural form was not necessarily the result of the landscape infrastructure, but more of a conceptual idea about the site and how the intervention should respond. However, the two work hand in hand as landscape infrastructure and urban form should always have a symbiotic relationship. I hope to explore these types of projects throughout my career, especially in my home country of Trinidad. I believe that this is a way creating an identity for the island by the way we engage our landscape through design. I am very grateful to be a designer and be able to explore these relationships through design. The journey over the last few years was a difficult one but in the end I am happy with what I have accomplished and what I have learned. As I bring this project to an end, I reflect on the beginning and what led me in this direction, and I realize that it is my love for nature and the environment, and therefore....... the investigation will continue.
References


