

FINAL REPORT

**Environmental and
Social Analysis for
Courtyard by Marriott**

Prepared for:

Caribe Hospitality Jamaica Ltd.

C/o Jamaica Property Company Ltd.

60 Knutsford Boulevard

Kingston 5

Prepared by:

Environmental Solutions Ltd.

89 Hope Road

Kingston 6

Submitted: October 17, 2012



PROPRIETARY RESTRICTION NOTICE

This document contains information proprietary to Environmental Solutions Limited and shall not be reproduced or transferred to other documents, or disclosed to others, or used for any purpose other than that for which it is furnished without the prior written permission of ESL.

All rights reserved. Environmental Solutions Ltd. ©

TABLE OF ONTENTS

1.0	INTRODUCTION	1
1.1	Purpose	1
1.2	Background	1
1.3	Project Description	2
1.3.1	Objective	2
1.3.2	Site Location and Existing Site Conditions	2
1.3.3	Project Components	3
2.0	LEGAL AND REGULATORY FRAMEWORK	10
2.1	IDB Environmental and Social Policy	10
2.1.1	IDB's Environment and Safeguards Compliance Policy	10
2.1.2	Natural Resource Conservation Act (NRCA)	11
2.1.3	Public Health Act	12
2.1.4	Joint Industrial Council	13
2.1.5	Kingston and St. Andrew Corporation (KSAC) Act	14
2.1.6	The Building Act	14
2.1.7	The Sustainable Tourism Master Plan	15
2.1.8	Caribe Hospitality's Environmental Social and Health Management System	15
2.1.9	Leadership in Energy and Environmental Design	16
3.0	ENVIRONMENTAL AND SOCIAL SETTING	18
3.1	Environmental Setting	18
3.1.1	Land use	18
3.1.2	Flora and fauna	19
3.1.3	Local air quality	19
3.1.4	Current noise levels	21
3.1.5	Geology and Soils	22
3.1.6	Natural Hazards	23

3.1.7	Water Resources	25
3.2	Social and Community Setting	27
4.0	ENVIRONMENTAL AND SOCIAL IMPACTS AND RISKS	38
4.1	Construction Phase	38
4.1.1	Natural Hazards	39
4.1.2	Alteration and/or Removal of Natural Habitats and Cultural Sites.....	39
4.1.3	Solid and Hazardous Waste.....	40
4.1.4	Occupational Health and Safety.....	41
4.1.5	Labour and Working Conditions.....	43
4.1.6	Socioeconomic Impacts	43
4.1.7	Other Environmental and Social Impacts and Risks	44
4.2	Operations Phase.....	44
4.2.1	Wastewater Generation and Disposal.....	44
4.2.2	Water Supply and Use	45
4.2.3	Invasive Species	45
4.2.4	Energy Supply and Use	45
4.2.5	Air Emissions	46
4.2.6	Solid Waste.....	46
4.2.7	Hazardous Materials	46
4.2.8	Life and Fire Safety/Emergency Response Planning.....	47
4.2.9	Occupational Health and Safety.....	49
4.2.10	Labour and Working Conditions	49
4.2.11	Socioeconomic Impact.....	50
4.2.12	Associated Impacts.....	50
4.2.13	Other Issues	50
4.3	Other Environmental and Social Risks	51
4.4	Cumulative Impacts.....	52
5.0	ENVIRONMENTAL AND SOCIAL MITIGATION AND MANAGEMENT	53

5.1	Environmental and Social Management Plan.....	53
5.1.1	Mitigation Measures for Potential Environmental Impacts Identified	53
5.1.2	Schedule for Mitigation Measures.....	60
5.1.3	Evaluation of Proposed Preventative / Mitigation Measures	64
5.1.4	Recommended Monitoring Protocols.....	64
5.1.5	Incorporation of sustainable alternatives.....	65
5.1.6	Implementation Schedule for Monitoring Environmental and Social Impacts.....	65
5.1.7	Review of Environmental and Social Management System.....	66
5.1.8	Recommended Management Actions	70
5.1.9	Adequacy of Resources	70
5.1.10	Environmental Initiatives.....	71
6.0	PUBLIC CONSULTATION.....	75
6.1	Public Concerns	75
7.0	CONCLUSIONS & RECOMMENDATIONS.....	76
7.1	Summary.....	76
	LIST OF REFERENCES.....	79
	APPENDIX I – Historical Land Use of Project Site and Situation	81
	APPENDIX II – Environmental Permit Terms and Conditions.....	87
	APPENDIX III – Courtyard by Marriott, Jamaica Draft LEED Scorecard	88
	APPENDIX IV – Soil Investigation Report.....	89
	APPENDIX V – Soil Penetration Test	90
	APPENDIX VI – Storm Water Pollution Prevention Plan	91
	APPENDIX VII – Marriott International INC. Human Rights Policy Statement.....	92
	APPENDIX VIII – Public Presentation.....	93

LIST OF TABLES

Table 1.1: Features of the Hotel	4
Table 3.1: Respirable Air Quality Data for Project Site on Park Boulevard	20
Table 3.2: Daytime Noise Levels on Project Site	21
Table 3.3: Guidelines for Vehicular Noise Limit (NEPA)	22
Table 4.1: Professionals on Project	51
Table 5.1: Schedule for Mitigation Activities	61
Table 5.2: Implementation Schedule for Monitoring Environmental and Social Impacts	66
Table 5.3: Environmental Aspects Considered in the Project Phases	67

LIST OF FIGURES

Figure 1.1: Site Location - Courtyard by Marriott, Kingston, Jamaica	2
Figure 1.2: Virtual View of Courtyard by Marriott, Kingston, Jamaica	4
Figure 1.3: Insulation of Walls (Source: Oak Ridge National Laboratory, 2008)	5
Figure 1.4: The Brac System. Grey Water Recycling (Brac System, 2010)	6
Figure 3.1: Kingston Development Plan - 1965	18
Figure 3.2: Air Quality Stations on Project Site	20
Figure 3.3 Caribbean Plate (Source: Gaba E. 2007)	24
Figure 3.4: Enriquillo Fault – Plantain Garden Fault (Red Dots Represent Past Earthquakes) (Source: University Of The West Indies. Earthquake Unit, 2007)	25
Figure 3.5: Hermitage Dam	26
Figure 3.6: Mona Reservoir	26
Figure 3.7: 1:50 000 Topography Map of Project Site Location and Sphere of Influence	27
Figure 3.8: Boundary of the Special Area, New Kingston (Source: STATIN)	28
Figure 3.9: Population of New Kingston by Age Group	29

Figure 3.10: Chronic Illnesses of The Disabled Population in St. Andrew 30

Figure 3.11: Population 15 Years and Over by Education Level 31

Figure 3.12: Dwellings by Type of Tenure 31

Figure 3.13: Dwellings by Type of Housing Unit 32

Figure 3.14: Households by Type of Fuel Used for Cooking 33

Figure 3.15: Road Network of New Kingston 34

Figure 3.16: Project Site and Surrounding Entities 36

Figure 3.17: Hotels in New Kingston..... 36

Figure 5.1: Concrete Trucks/ Pumps Washout Pit 55

Figure 5.2: Storm Drain Inlet Protection Catch Pits 60

Figure 5.3: SWPPP Template for Corrective Action Log 71

Figure 5.4: SWPPP Template for Subcontractor Certifications/ Agreements 72

Figure 5.5: SWPPP Template for Training Log..... 73

Figure 5.6: SWPPP Template for Delegation of Authority Form 74

1.0 INTRODUCTION

1.1 PURPOSE

The report represents the Environmental and Social Analysis prepared for Caribe Hospitality Jamaica Limited, to submit to the Inter-American Development Bank (IDB).

The purpose of the Environmental and Social Analysis (ESA) is to provide Caribe Hospitality with this information and meet international best practice for undertaking environmental and social analysis of the proposed project. This ESA has informed a recommended environmental and social management plan that contains the necessary mitigation, management, and monitoring measures to manage these impacts and risks for the life of the project.

1.2 BACKGROUND

Caribe Hospitality Jamaica Ltd. has received an Environmental Permit for the construction and operation of a small hotel to be operated as Courtyard by Marriott, Kingston, Jamaica. The hotel will be constructed to accommodate 130 rooms and will target a clientele of business travellers. Construction is proposed to start during the last quarter of the year 2012 with an expected construction period of approximately 15-18 months.

Approvals from the following Government of Jamaica agencies have been granted:

- ✓ Kingston and St. Andrew Corporation (KSAC)
- ✓ National Environment and Planning Agency (NEPA)

Small hotel and resort projects tend to have minimal to moderate impacts and risks, which are limited to specific issues such as construction impacts, health and safety risks, waste generation, food and hygiene issues, and the use of natural resources such as water, during operation. As such, this Environmental and Social Analysis is prepared for Courtyard by Marriott, Kingston, Jamaica as tool to evaluate the specific issues related to the development.

1.3 PROJECT DESCRIPTION

1.3.1 OBJECTIVE

Caribe Hospitality Jamaica Ltd. intends to construct and operate 6 storey building with an ancillary retail space as a commercial development. The hotel is expected to meet the Leadership in Energy and Environmental Design (LEED) standards set by the US Green Building Council. LEED consists of a suite of rating systems for the design, construction and operation of high performance green buildings, homes and neighbourhoods.

1.3.2 SITE LOCATION AND EXISTING SITE CONDITIONS

At 1 Park Close, the project site is located in New Kingston, a major business district with commercial and service enterprises and hotels catering primarily to business travellers. Immediately adjacent to the site is public recreational space entitled Emancipation Park, offices and parking garage of the National Housing Trust. Section 3.2 elaborates. Figure 1.1 shows a Google image of the site location.

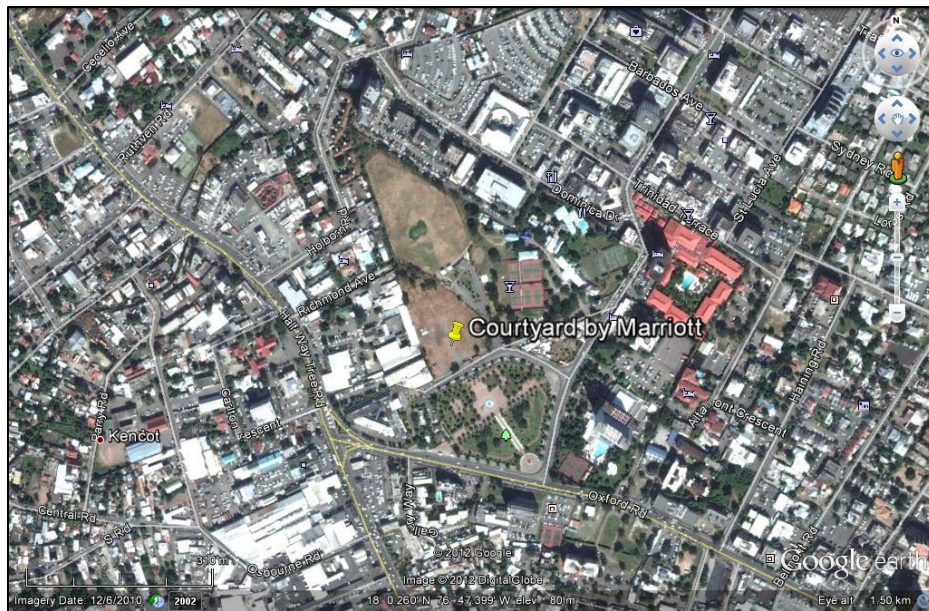


FIGURE 1.1: SITE LOCATION - COURTYARD BY MARRIOTT, KINGSTON, JAMAICA

The project area is 6172.49m² and the surface area is covered with a mix of grass and gravel. A few specimen trees are on site at the southern and eastern boundaries. The site is highly disturbed and represents an undeveloped lot within the New Kingston area. New Kingston evolved from the transformation of the Knutsford Park horse racing complex, in response to a perceived need to establish a new business centre outside of downtown Kingston.



PLATE 1.1: THE PROJECT SITE

The site is mostly flat and shows no draining pattern. Based on the topography, it is assumed that stormwater infiltrates within the site, and any excess during a heavy rainfall runs off to the south-west corner where the level is lower, and overflows to the curb and gutter (Plate 1.1).

1.3.3 PROJECT COMPONENTS

Main Building, Facilities and Equipment

This development consists of a single 6 storey Hotel Building on the lot with an ancillary retail space and exterior areas consisting of parking spaces, access roads and a porte cochere. As indicated above, the hotel will accommodate 130 guest rooms (Figure 1.2). Table 1.1 outlines the features of the hotel on each floor.

The main construction material to be used is reinforced concrete. Some geotechnical work has been done which includes soil tests of the proposed construction site.



FIGURE 1.2: VIRTUAL VIEW OF COURTYARD BY MARRIOTT, KINGSTON, JAMAICA

TABLE 1.1: FEATURES OF THE HOTEL

Floor	Features
Ground Floor	Bar, lounge, lobby, kitchen, restaurant, housekeeping, laundry room, staff room, mechanical rooms (generator, transformer, electrical rooms), recycling area, workshop, maintenance room, administrative offices, rest rooms, court yard, 3 meeting rooms, business centre
First Floor	Guest rooms
Second Floor	Guest rooms
Third Floor	Guest rooms
Fourth Floor	Guest rooms
Sixth Floor (Roof)	Rooftop gymnasium, pool and bar

Construction material to be used includes reinforced concrete frames and walls. The exterior walls will be insulated to meet ASHRAE 90.1 standards (The American Society of Heating, Refrigerating and Air-Conditioning Engineers). ASHRAE 90.1 is an *Energy Standard for Buildings Except Low-Rise Residential Buildings*. This standard is characterised by the insulation of exterior walls. In the case of Courtyard by Marriott, a layer of insulation and gypsum board will be placed on the inner-walls to decrease the load on

the Air Conditioning System (Figure 1.2). This system recovers cooling from exhaust using an enthalpy wheel back into space.

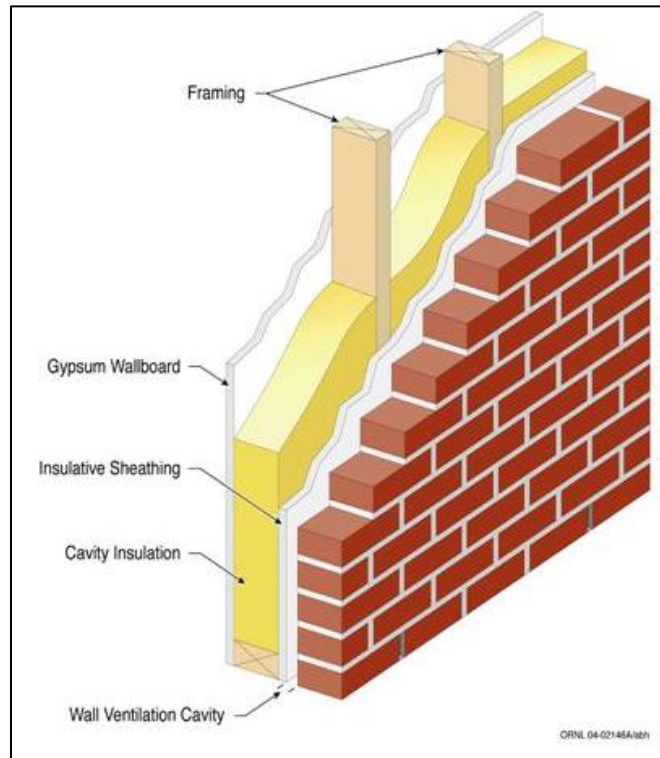


FIGURE 1.3: INSULATION OF WALLS (SOURCE: OAK RIDGE NATIONAL LABORATORY, 2008)

Main equipment associated with the construction of the hotel will include water chillers for the air conditioning, kitchen and laundry equipment, an emergency generator which will provide 100% back-up power (600KVA), a constant water pressure system, a fire pump, and a fire alarm.

The project will be divided in two stages:

1. Hotel Building and Exterior areas
2. Retail spaces

The retail area is outside LEED boundary for purposes of LEED Certification, however it will be considered in the Stormwater Pollution Prevention Plan which guides the overall construction process.

Ancillary Facilities

The hotel will have a kitchen and an on-site laundry.

- **Water supply**

Water supply during construction and operation will be supplied from the public main by the National Water Commission (NWC).

There will be grey water recycling on the project site. The grey water recycling system to be used is the Brac System. This system is composed of patented, state-of-the-art components that filter used water from showers, baths and laundry, and then reuses it for the toilet's evacuation system.

The recycled water (i.e. grey water), is used only for the toilet or for irrigation, and cannot get into the drinking-water system.

The Brac system allows for foreign particles to be filtered from the grey-water. Figure 1.4 illustrates.

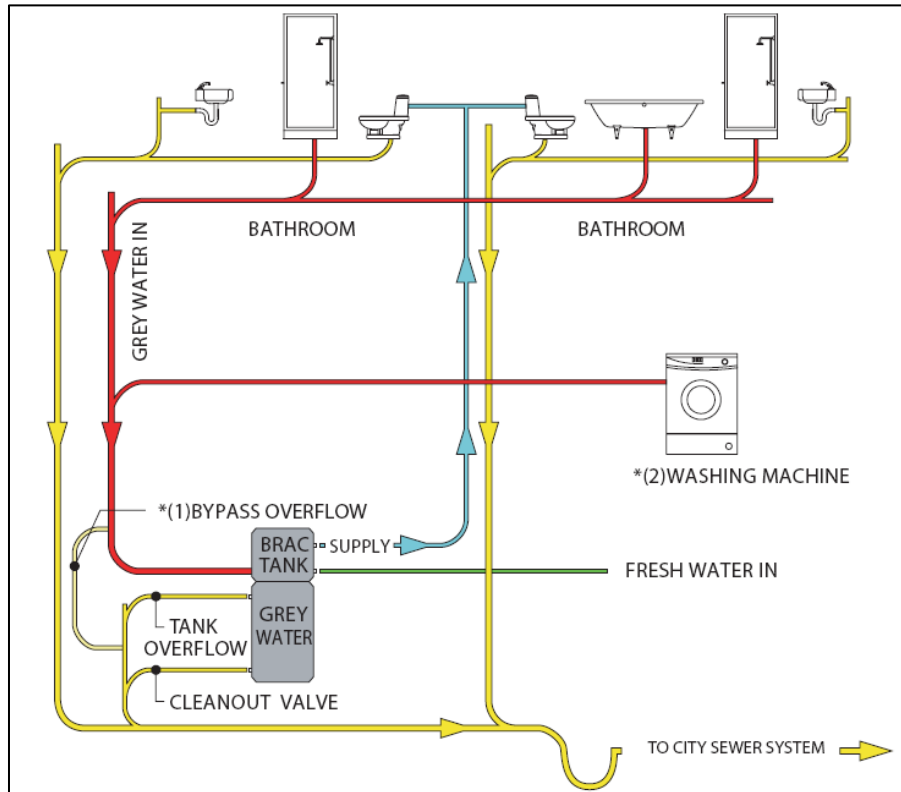


FIGURE 1.4: THE BRAC SYSTEM. GREY WATER RECYCLING (BRAC SYSTEM, 2010)

- **Waste water treatment**

Wastewater and sewage will be connected to the NWC sewage main. The Brac system will be installed as indicated above to treat and reuse some water from washing showers, baths and laundry. Excess water channelled to the Brac system would be automatically sent to the NWC Sewer main.

- **Electricity Supply**

Electricity will be supplied from the Jamaica Public Service Company (JPSCo) both during the construction and the operation phase. An emergency generator will also be installed to provide 100% back-up power (600KVA). Running hours cannot be predicted since it will only be used if there is an emergency and the

JSPCo power supply is unavailable. Several energy conservation measures will be employed at the hotel. These are detailed in Section 2.1.7.

- **Waste Disposal**

During construction and operation, waste will be collected by a contracted company, and will be disposed of at the approved disposal site in Kingston.

During the 18 month construction period, an estimate of one 18m³ container of solid waste per week is expected. Waste disposal during construction would be guided by provisions outlined in the Stormwater Pollution Prevention Plan which requires the undertaking of the best management practices to be employed on the construction site.

During operation, an estimate of two 6m³ container of solid waste per month is expected during full occupancy. The same process would apply whereby a certified contractor will collect and transport to the Riverton disposal site.

Drainage

There is no public storm sewer system in the project area and properties have to mitigate their storm water within their boundary. A storm water system has been designed for the project and will include several drainage wells to infiltrate the storm water within the site, and a storm water detention tank will be constructed to mitigate the peak discharge rate and volume to allow the drainage wells to absorb the design event. There are also plans to allow storm water to enter the Brac system for treatment and re-use.

Project Workforce

During construction, approximately 200 workers will be employed. A local contractor will be contracted to execute the construction phase. During operation, approximately 65 individuals will be hired.

Project Status, Schedule and Costs

Currently, Caribe Hospitality Jamaica Ltd. is completing the design phase of the project. They have received an Environmental Permit from the National Environment and Planning Agency (NEPA) for Construction and Operation of a Hotel Complex with Twelve or more rooms.

Contracts for negotiating loans have not yet been finalised. The developer is completing this Environmental and Social Analysis as one of the requirements for accessing the IDB loan. Funds will also be accessed from the International Finance Corporation (IFC) of the World Bank Group.

The project is scheduled to start November 1, 2012 with Phase I of the construction. The construction is expected to run for approximately 18 months and the planned completion of the project should be May 1, 2014.

Direct construction costs are estimated to be \$11,050,000 and contingencies approximately \$1,105,000. A total of \$12,155,000 has been estimated for construction costs only.

Site History

The New Kingston area evolved from the transformation of the Knutsford Park horse racing complex, in response to a perceived need to establish a new business centre outside of downtown Kingston. The immediate project site was always an empty lot immediately adjacent the Knutsford Park Race Course based on the aerial images in Appendix I. In recent times, the site has been used for parking when there are major events and for storage of a few containers with chairs and other items used on occasion at Emancipation Park south of the project site. Areas of compacted gravel are evident on the site.

Previous land ownership based on title records from the National Land Agency since 1910 also indicates that the parcel of land was not previously developed (Appendix I). Previous land uses that could present potential issues for risks or liabilities are not evident for this site.

Project Justification and Analysis of Alternatives

The project is being developed as a commercial investment in a business hotel. It is important to note that environmental and social considerations have been integrated from inception. The Courtyard by Marriott is known for its high business, environmental and social values and standards and its Corporate Social Responsibility Programme is implemented in all its hotels. Courtyard by Marriott, Kingston Jamaica will comply. Marriott has 13 hotels across all brands that are Leadership in Energy and Environmental Design or LEED-certified by the U.S. Courtyard by Marriott is being constructed to meet LEED standards as described earlier. Several energy and water conservation measures have been considered in the project design phase and will continue through the construction and operation phases. In addition, Marriott International has placed issues facing the environment which ignited the formation of their countrywide Environmentally Conscious Hospitality Operations (ECHO) programme. The programme involves:

- ✚ Water and Energy Conservation
- ✚ Clean Air Initiatives
- ✚ Reduce-Reuse-Recycle
- ✚ Clean-up Campaigns
- ✚ Wildlife Preservation

The project site in New Kingston has been selected due to land availability. The site is ideally situated in a prime business area of Kingston. Other similar business hotels are also located in the vicinity. The site is not located in an environmentally sensitive area and as such there are no significant environmental factors for consideration. There are also no significant environmental features on the project site.

Considerations for Disaster Risk Management

The hotel to be constructed is designed to meet the Miami-Dade wind loads, including the impact resistant glazing. This is based on the Florida Building Codes. Many Caribbean hotels use this standard as similar conditions are likely. The 2010 edition of the Florida Building Code introduces significant changes to wind

load design, in particular the presentation of the wind speed maps. The key changes will be further discussed and are summarized as follows:

- New strength design-level wind speed maps
- Changes to the Wind-borne Debris Region
- Introduction of Exposure Category D for water surfaces in Hurricane-Prone Regions

The building has also been designed to comply with local building codes which include standards for seismic activity and for tropical cyclone activity in Jamaica.

The project site will be equipped with an emergency generator to provide 100% back-up of the electricity usage for the hotel complete, that is, approximately 600KVA. This will accommodate electricity wherever there is a crises or a power cut by the JPSCo who are the electricity providers.

The fire suppression and detection systems will meet the National Fire Protection Association (NFPA) codes and standards. NFPA is an international non-profit organisation in the USA, established in 1896. NFPA has a mission to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education. NFPA develops, publishes, and disseminates more than 300 consensus codes and standards intended to minimize the possibility and effects of fire and other risks.

2.0 LEGAL AND REGULATORY FRAMEWORK

Several local and international policies and legislation have been reviewed and evaluated within the context of compliance by Courtyard by Marriott.

2.1 IDB ENVIRONMENTAL AND SOCIAL POLICY

2.1.1 IDB'S ENVIRONMENT AND SAFEGUARDS COMPLIANCE POLICY

The Environment and Safeguards Compliance Policy was approved by the IDB's Board of Executive Directors on January 19, 2006. The Policy was made effective in July 2006. It supersedes the Bank's previous environment policy, which dated to 1979, and reinforces the environmental mandates of the Eighth Capital Replenishment.

The Policy has three specific objectives:

- I. to enhance long-term development benefits by integrating environmental sustainability outcomes in all Bank operations and activities and strengthening environmental management capacities in its borrowing member countries;
- II. to ensure that all Bank operations and activities are environmentally sustainable; and
- III. to foster corporate environmental responsibility within the Bank that are applicable for the operation, and the project's level of compliance with those policies (searching of the IDB website can facilitate the identification and procurement of the policies);

The Policy applies to the Inter-American Development Bank (IDB) and the Multilateral Investment Fund (MIF), including financial and nonfinancial products, public sector and private sector operations, as well as environmental aspects of the Bank's project procurement practices and management of its own facilities.

This policy is therefore applicable to this project which is being funded by the IDB. The Policy Directives are structured under two major categories: (a) environmental mainstreaming; and (b) environmental safeguards.

The Bank will support mainstreaming efforts in its borrowing member countries through actions that:

- Enhance social development and increase the overall quality of life, recognizing that investments in environment and natural resources management are sources of jobs, sustainable income, improved health and better living conditions, particularly for the poor.
- Strengthen good governance by developing effective environmental management frameworks and transparent governance mechanisms that strengthen institutional capacity building, civil society participation, public access to information, the rule of law, the use of market-based instruments, and policy development.
- Enhance the country's competitiveness by improving and promoting the conservation of the region's natural capital, enhancing the value of environmental goods and services as well as

encouraging and facilitating private sector participation and investments in environment-related activities.

- Strengthen regional integration, by supporting regional capacities to protect and manage regional environmental goods and services.

The Bank applies safeguards throughout the project cycle to ensure the environmental sustainability of all Bank-financed operations. Bank-financed operations require mitigation measures; and for impacts that cannot be fully mitigated, compensation or offsets should be implemented. Bank safeguard policies and directives relate to the need for the borrower to consider the following:

- Bank policies
- Country laws and regulations
- Screening and classification according to potential environmental impact
- Other risk factors that may affect the environmental sustainability of operations
- Environmental assessment requirements
- Consultations
- Supervision and compliance
- Trans boundary issues associated with the operation
- Natural Habitats and Cultural Sites
- Hazardous materials and substances
- Pollution prevention and abatement
- Project under construction compliance with all relevant provisions of this Policy
- Noninvestment lending and flexible lending instruments
- Multiple phase and repeat loans
- Co-financing operations
- In-country systems
- Procurement

2.1.2 NATURAL RESOURCE CONSERVATION ACT (NRCA)

The National Environment and Planning Agency (NEPA) was established as an Executive Agency on April 1, 2001. NEPA represents a merger between the Natural Resources Conservation Authority (NRCA), the Town Planning Department (TPD) and the Land Development and Utilization Commission (LDUC).

The Natural Resources Conservation Authority (NRCA) Act, under which NEPA operates, provides for the management, conservation and protection of the natural resources of Jamaica. The NRCA Act was enacted in 1991 to provide a framework for the effective management of the physical environment of Jamaica. The NRCA is given wide functions and duties including to develop, implement and monitor plans and programmes relating to the management of the environment and to formulate standards and codes of practice for the improvement and the maintenance of the quality of the environment.

Section 10 of the NRCA Act gives the NRCA the power to directly request Environmental Impact Assessments (EIAs) from any applicant for a permit or (even more broadly) from any person who is doing

any undertaking in a prescribed area where it is of the opinion that the environment is likely to have adverse effects due to the activities.

The Natural Resources (Prescribed Areas) (Prohibition of Categories of Enterprise, Construction and Development) Order, 1996 and the Permits & Licensing Regulations was passed pursuant to section 9 of the Natural Resources Conservation Authority Act, 1991. The Order provides that the entire island of Jamaica is a prescribed area and lists specified categories of enterprise, construction or development that require a permit.

The development of the Courtyard by Marriott, Kingston, Jamaica by Caribe Hospitality of Jamaica Ltd required the submission of an Environmental Permit Application to NEPA for approval of the project. This was submitted through Jamaica Property Company Limited and an Environmental Permit has been granted for the **Construction and Operation of a Hotel Complex with Twelve (12) or more rooms**. The permit granted is subject to terms and conditions set by the NRCA and these should be adhered to during construction and operation. The terms and conditions of the permit have been presented in Appendix II. These terms and conditions, in addition to general requirements, have specified requirements with respect to the following areas:

- Documentation
- Room count
- Sewage Treatment
- Drainage
- Hazardous Materials
- Dust Control
- Noise Abatement
- Solid Waste Disposal
- Safety
- Landscaping
- Traffic Management
- Environmental Management and Monitoring

NEPA did not require that an EIA to be conducted for this development.

2.1.3 PUBLIC HEALTH ACT

The Public Health Act establishes a Local Board of Health for each parish in the island (see section 5). By section 6, the Local Boards of Health are empowered, inter alia, to carry out all activities which appear to them to be requisite, advantageous or convenient in the interest of public health. The Local Boards of Health are authorized by section 7 to promulgate regulations for a wide variety of matters for example:

- the inspection and maintenance of sanitary conditions in bathing beaches and swimming pools;
- the inspection and maintenance of sanitary conditions in shops, restaurants and other eating establishments, and all other premises where articles of food or drink are manufactured, or prepared for sale, stored, handled or sold;

- nuisances;
- the sanitary collection and disposal of garbage and other waste matter;

A key role of the local Boards of Health is to monitor water quality within their respective areas. The Ministry of Health is also responsible for water quality monitoring and water quality data throughout the island.

Public Health Regulations

The following public health regulations apply to the establishment of Courtyard by Marriott, Kingston Jamaica.

- I. The Public Health (Food Handling) Regulations, 1998
- II. The Public Health (Swimming Pools) Regulations, 2000
- III. The Public Health (Tourist Establishments) Regulations, 2000

The Public Health (Food Handling) Regulations, 1998 require that a Licence is required to operate a food-handling establishment. These persons are expected to meet all the requirements set out under or pursuant to the Public Health Act; and meet the minimum operational health standards set for all food-handling establishments and persons who are licensed operators under these Regulations.

The Public Health (Swimming Pools) Regulations, 2000, states that no person shall operate a public swimming pool unless that person has a valid permit issued by the Medical Officer (Health), and satisfies the requirements of regulation 8.

The Public Health (Tourist Establishment) Regulations, 2000 (L.N. 71/2000) establishes a regulatory framework for the health of tourist establishments. Persons who intend to operate a tourist establishment shall apply to the Medical Officer (Health) for a health certificate in respect of that tourist establishment. Under regulation 31 every tourist establishment shall be provided with an adequate and continuous supply of potable water from a sanitary source, which could be from NWC, the Parish Council of the area or any other source approved by the Medical Officer of Health. The Regulations also address the issue of water quality in tourist establishments.

The developers will ensure that they acquire the requisite permit and licences to meet the local public health requirements.

2.1.4 JOINT INDUSTRIAL COUNCIL

Joint Industrial Council (JIC) comprises the Incorporated Masterbuilders Association of Jamaica (IMAJ), the Bustamante Industrial Trade Union, the National Workers' Union and the Trade Union Congress. They have established building and construction industry standard rates for construction workers.

Caribe Hospitality of Jamaica Ltd. the developers of Courtyard by Marriott, Kingston, Jamaica must ensure that their construction working hours and rates meet the requirements set by the JIC for the industry.

2.1.5 KINGSTON AND ST. ANDREW CORPORATION (KSAC) ACT

The Kingston and St. Andrew Corporation (KSAC) Act establishes the Kingston and St. Andrew Corporation to regulate and manage several key development aspects within its boundaries. These areas include:

- Roads
- Public Health
- Poor Relief
- Public Cleansing
- Traffic
- Street Lighting
- Town Planning and Development
- Parks and Cemeteries
- Ward Theatre
- Markets
- Abattoir
- Municipal Police (Special D/Cs)
- Animal Pound
- Licences

The KSAC is responsible for review all proposed building design to ensure they have met local standards prior to issuing a permit to build. The building designs for the Courtyard by Marriott, Kingston Jamaica development have already been approved by the KSAC.

2.1.6 THE BUILDING ACT

The Building Act applies to building work in the entire Jamaica and has been established to:

- I. regulate the design, construction, maintenance, demolition, removal, alteration, repair and use of buildings and building work so as to protect the public safety and health;
- II. give effect to the National Building Code of Jamaica; and
- III. facilitate-
 - a. the adoption and efficient application of internationally-recognized building standards;
 - b. the accreditation of building products, construction, methods, building components and building systems;
 - c. enhance amenities in general and require the construction of buildings that provide easy access and adequate amenities for persons with disabilities in particular;
 - d. promote cost effectiveness in the construction of buildings;
 - e. promote the construction of environmentally and energy efficient buildings;
 - f. establish an efficient and effective system for issuing building permits and certificates of occupancy and for resolving building disputes, including through alternative dispute resolution;

- g. regulate the standard of training and certification and provide for the licensing of building practitioners and the recognition of building professionals who are regulated under other Acts; and
- h. establish a building and an appeal process.

The KSAC is mandated to administer and enforce the provisions of this Act including the National Building Code within the area of jurisdiction of the Authority.

2.1.7 THE SUSTAINABLE TOURISM MASTER PLAN

The **Sustainable Tourism Master Plan (STMP)**, approved in 2002, is an important component of the policy environment of the tourism sector. This plan has a strong environmental component, and was developed through a collaborative approach among several relevant agencies.

Environmental sustainability is incorporated as a part of the strategic objective of the STMP, in recognition of the environment as the fundamental resource base. It recognises that resort centres have already exceeded their carrying capacity and that increasing social and physical infrastructure and improving environmental management are pre-conditions to further growth. The specific strategic vision states:

“Environmental Sustainability *The environment is the product. Its preservation requires adherence to a location strategy that concentrates rooms and the investment of resources to help mitigate environmental impact in the three major resort centres. The industry must be provided with an incentive and the expertise required to adopt best practice on environmental issues.”*

2.1.8 CARIBE HOSPITALITY’S ENVIRONMENTAL SOCIAL AND HEALTH MANAGEMENT SYSTEM

The developers, Caribe Hospitality, have an Environmental Social and Health Management System that is implemented in all their hotel developments. This system outlines specific sustainability policies that guide hotel operations. The system includes identification of social and environmental aspects and impacts within the phases:

- ✓ Planning and Design
- ✓ Construction and Start up or “commissioning”
- ✓ Operation

The system has a compliance process to monitor activities throughout these three phases. This ensures that social and environmental impacts are controlled.

Objectives and indicators have been set to assist in monitoring the process. Programs, plans and procedures have been developed to implement prevention and mitigation activities to ensure there are none or limited environmental and social impacts. Formation, awareness and professional competence are also

considerations under this management system. Audits and inspections are also done to evaluate the management system.

Version 3.0 of the Environmental Social and Health Management System document is currently under revision and will be used for this project.

2.1.9 LEADERSHIP IN ENERGY AND ENVIRONMENTAL DESIGN

Leadership in Energy and Environmental Design (LEED) is an internationally recognized green building program developed by the U.S. Green Building Council (USGBC). It consists of a suite of rating systems for the design, construction and operation of high performance green buildings, homes and neighbourhoods.

LEED performance credit system is geared at allocating points based on the potential environmental impacts and human benefits of each credit. Points are distributed across the following major credit categories:

- Sustainable Sites
- Water Efficiency
- Energy
- Atmosphere
- Materials and Resources
- Indoor Environmental Quality
- Innovation and Design Process
- Regional Priority Credits

LEED provides building owners and operators the tools they need to immediately impact their building's performance and bottom line, while providing healthy indoor spaces for a building's occupants. Participation in the voluntary LEED process demonstrates leadership, innovation, environmental stewardship and social responsibility (U.S. Green Building Council, 2012). LEED-certified buildings are designed to:

- ✓ Lower operating costs and increase asset value
- ✓ Reduce waste sent to landfills
- ✓ Conserve energy and water
- ✓ Be healthier and safer for occupants
- ✓ Reduce harmful greenhouse gas emissions
- ✓ Qualify for tax rebates, zoning allowances and other incentives in hundreds of cities

(U.S. Green Building Council, 2012)

The KSAC, in the approved building permit given to the developer, encouraged the developer to implement LEED to at least the minimum level of certification for the proposed development. LEED rating system classifies buildings at four levels of certification:

- Certified: 40–49 points
- Silver: 50–59 points
- Gold: 60–79 points
- Platinum: 80 points and above

Courtyard by Marriott, Kingston Jamaica will be designed and constructed to meet LEEDs' Silver level certification. The draft scorecard has been presented in Appendix III. This scorecard attached is not complete and is in the process of being finalised.

3.0 ENVIRONMENTAL AND SOCIAL SETTING

3.1 ENVIRONMENTAL SETTING

3.1.1 LAND USE

The site is within the commercial quadrant of New Kingston. There are no existing critical habitats or endangered species on the site.

The property has been over the years used as a parking lot on specific occasions. On the 1965 Kingston Development plan, the project site was identified under the category of green open space, which is immediately adjacent to the commercial quadrant of New Kingston (See Figure 3.1).

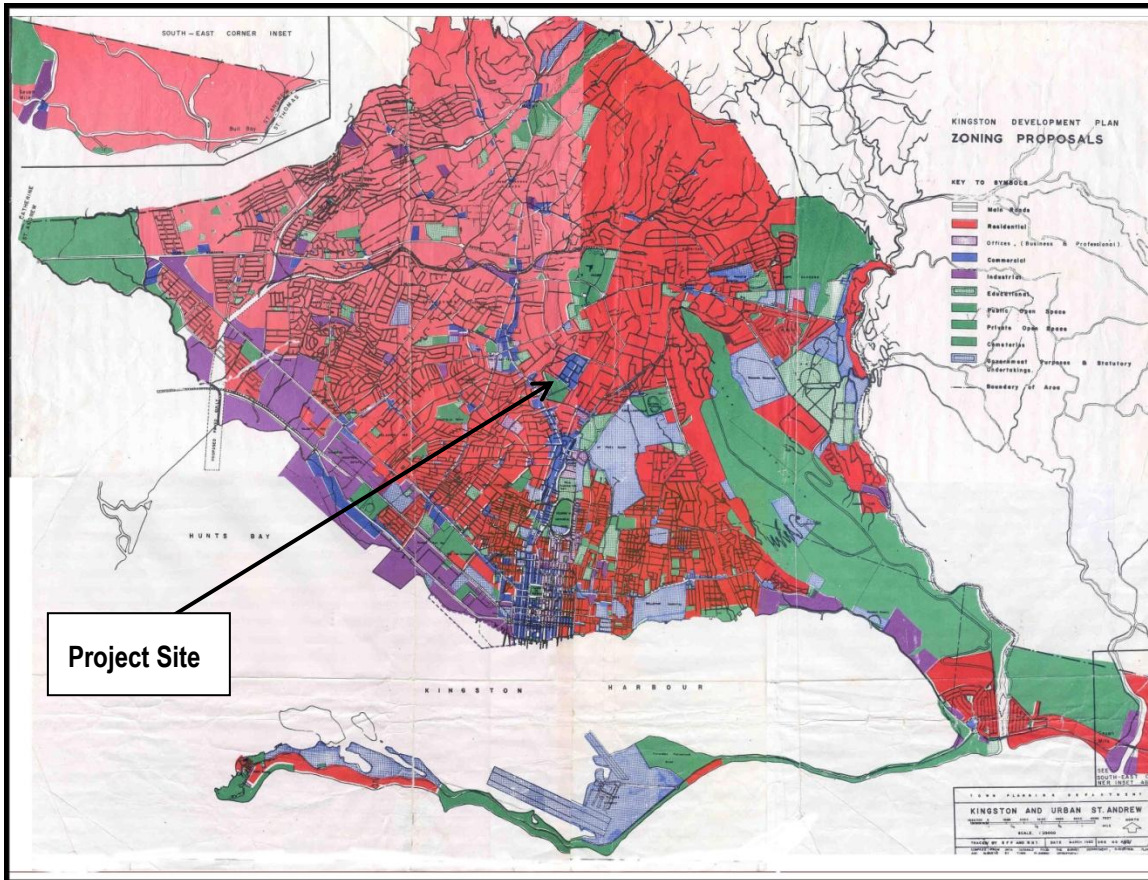


FIGURE 3.1: KINGSTON DEVELOPMENT PLAN - 1965

As indicated earlier in Section 1.3.3 the site was immediately adjacent to the Knutsford Park Race Course. Five historical aerial photographs placed in Appendix I of this report illustrate land use of the project site and situation since 1941 to date. These images confirm the absence of development on the project site since 1941.

Appendix I also presents the original title diagram of the parcel of land from the National Land Agency. Based on title records from the National Land Agency since 1910, previous land owner titles indicate that the parcel of land to be developed was not previously developed.

Additionally, the Soil Investigation Report conducted by Jentech Consultants (2011) revealed that there are no indications of previous land use since there was no evidence of building construction or fill material; no soil discolouration or odour; and no contamination on the site or on any soil samples taken.

3.1.2 FLORA AND FAUNA

No sensitive habitats or species exist on site or in the vicinity of the project area. Emancipation Park is located across the road from the project site, a visual resource.

No unique ecological features to be preserved were identified. Some specimen trees such as *Albizia lebbbeck* commonly called “woman’s tongue” are located on the southern and eastern boundary of the site (Plate 3.1).



PLATE 3.1: TREES ALONG SOUTHERN BOUNDARY OF PROJECT SITE

Specimen Trees measuring more than 1m in circumference at 1m height from the ground will be preserved. Trees with a lesser circumference will be evaluated on a case by case basis, and will be preserved, with the exception of the trees that may be located in the project’s main driveway entrance. If a tree is cut, new trees of similar species will be planted in designated planter areas within the car park and landscaping areas.

3.1.3 LOCAL AIR QUALITY

In order to establish baseline conditions, air quality samples were taken at 4 stations on the project site (See Figure 3.2). The site consists of a mix of grass and gravel. There is no activity on the immediate site. On the western boundary of the site is the NHT parking lot and on the eastern boundary is the Liguanea Club. On the southern boundary is Emancipation Park and north of the site is a private property. Taxi operators

often park along section of Park Boulevard and Park Close. Based on the site characteristics and type of surrounding activities, the air quality is expected to be of fairly high standard.

All the monitoring data recorded respirable particulate matter (PM10) significantly below the national outdoor standard (Table 3.1). Stations #1 and #4 showed the highest particulate matter which is likely due to their proximity to vehicular traffic from Park Boulevard and the NHT car park. Station #2 had the lowest value possibly due to low vehicular traffic and the presence of secondary vegetation filtering potential air pollutants.



FIGURE 3.2: AIR QUALITY STATIONS ON PROJECT SITE

TABLE 3.1: RESPIRABLE AIR QUALITY DATA FOR PROJECT SITE ON PARK BOULEVARD

Sample ID	Location	Monitoring Results $\mu\text{g}/\text{m}^3$	NEPA 24 Hr Guideline $\mu\text{g}/\text{m}^3$
		August 15-16, 2012	
Station #1	South eastern section of site. Close proximity to the entrance on Park Boulevard.	22.8	150
Station #2	North eastern section of site. Secondary vegetation was significant in this section.	9.0	
Station #3	North western section of site. This section of the site was grassy.	16.5	

Sample ID	Location	Monitoring Results $\mu\text{g}/\text{m}^3$	NEPA 24 Hr Guideline $\mu\text{g}/\text{m}^3$
		August 15-16, 2012	
Station #4	The western central section of the property, close to the NHT car park.	21.6	

3.1.4 CURRENT NOISE LEVELS

The site was sunny and windy when the baseline noise levels were taken. Vehicular traffic was prevalent within the area during the assessment. Noise levels on the project site were taken at each of the stations where 24 hour air quality samples were taken. Table 3.2 below illustrates daytime noise levels captured on the project site.

TABLE 3.2: DAYTIME NOISE LEVELS ON PROJECT SITE

Noise Levels on Project Site			
Location	High	Low	Geometric Mean
Station 1	80.0 dBA	75.5 dBA	77.71743691
Station 2	87.6 dBA	74.0 dBA	80.51335293
Station 3	77.6 dBA	70.5 dBA	73.96485652
Station 4	86.6 dBA	73.0 dBA	79.50974783
Geometric Mean			77.88575683

The average noise level for the project site is 77.9 dBA which is outside the allowable daytime noise guideline of 70 dBA at the boundary of the site as stipulated in the Environmental Permit received from NEPA for monitoring construction of the proposed development. Windy conditions that existed on site and vehicular traffic along Park Boulevard during data collection can alter background sound levels and are likely reasons for the values shown in Table 3.2 above. The construction monitoring plan will take into consideration the existing noise levels to ensure that the activities on site do not present a noise nuisance for neighbours. Noisy activities will generally not be performed during night time hours when the noise guideline is 55 dBA.

NEPA will be presented with a baseline for noise conditions prior to construction with appropriate recommendations. NEPA has already indicated that they have no problem with the proposed strategy to accommodate a reasonable adjustment in the permitted noise level as necessary.

Table 3.3 below illustrates vehicular noise limits and the existing average 77.9 dBA is within the limit as outlined in the guidelines for all vehicular types.

TABLE 3.3: GUIDELINES FOR VEHICULAR NOISE LIMIT (NEPA)

VEHICLE	NOISE GUIDELINE
Motorbike	85 dBA
Motorcar	85 dBA
Small Commercial Vehicle	90 dBA
Large Commercial Vehicle	95 dBA

3.1.5 GEOLOGY AND SOILS

Based on the Soil Investigation Report performed by Jentech Consultants Ltd. (2011), the project site falls within the geological deposit known as the Liguanea Plains alluvium. This geotechnical work has been presented in Appendix IV. Previous investigations suggest that compact to very dense mixtures of sands and gravels can be expected.

Based on the investigations conducted, no ground water was encountered within the depths explored. The presumptive soil profile indicates that the site overlies:

- a. Compact, gravely, coarse to fine sand or medium to fine sand with silt (TOP) down to depths of 6m
- b. Compact medium to fine sand with silt (MID1) approximately 1.5m thick and encountered below the TOP layers.
- c. Compact, gravely, coarse to fine sand (MID2) approximately 1.5m thick and encountered below the TOP or MID1 layers
- d. Very still, silty clay (MID3) approximately 1.5m thick and encountered below the MID layers and atop the BOT layers within the soil profile
- e. Very dense, coarse to fine gravely sand/ sand with gravel (BOT) encountered below depths of 10m on site and in which almost all boreholes were terminated.

Based on the soil investigation completed, the results revealed that in the absence of ground water, and with relatively dense subsoils with appreciable coarse and fine grained content, liquefaction is not expected on site in the event of the Maximum Credible Earthquake (MCE) or lesser event.

According to the International Building Code (2009), the project site can be classified as site Class D with mapped spectral acceleration for short periods, $S_s=0.62g$ and one second periods, $S_1= 0.27g$ for an earthquake with a 2% probability of exceedance in 50 years.

The total settlement across the site is not expected to exceed the allowable for the structures proposed on site.

The standard penetration test conducted by Jentech Consultants Ltd. (2012) presented in Appendix V determined that below the sand and gravel material relatively thin layers of silty clay and silt were present and these were sufficient to significantly reduce permeability on site. This underlines a major issue with the permeability or hydraulic conductivity of Liguanea Plains alluvium that should be considered in the design of any injection system. The borehole was repeated to a depth of 13.7 m and the test again revealed the issue of impermeability.

3.1.6 NATURAL HAZARDS

Jamaica's geographical position makes the island prone to climate-related and geophysical hazards, namely tropical cyclones and seismic activity respectively. The Marriott Courtyard, Kingston Jamaica is therefore exposed to these hazards and so the project should take these hazards into consideration during the design, construction and operation phases.

Climate Related Hazards

Jamaica is located in the tropics and in the hurricane belt. The hurricane season is experienced during the six month period June to November. During this season, Jamaica is prone to tropical weather systems such as: tropical disturbances/ tropical waves, tropical depressions, tropical storms and hurricanes. With conditions such as these, lightning and thunderstorms, strong winds and floods are often associated.

The construction design and procedures would need to take these possibilities into consideration and put plans in place that can be followed by the project team to prevent and mitigate possible impacts from these hazards. The operational phase should also have an emergency response plan in place for the hotel staff to manage in such cases.

Geophysical Hazards

Jamaica is located on the north-central Caribbean Plate. At the plate margin, movement causes earth tremors (See Figure 3.3). Jamaica lies in earthquake Zone 3 and has a high probability of major damage from magnitude 6 - 7 earthquakes.

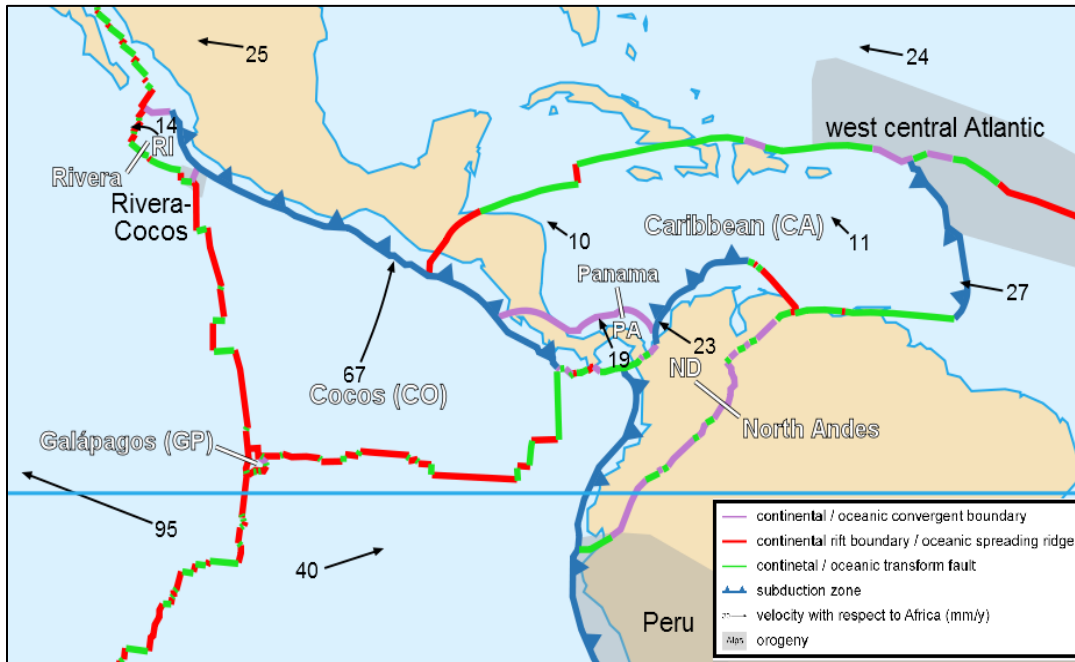


FIGURE 3.3 CARIBBEAN PLATE (SOURCE: GABA E. 2007)

Jamaica therefore lies in a region that is seismically active, meaning it is susceptible to earthquakes. Compared to other active zones in the world, Jamaica has few earthquakes and they are usually of low intensities (See Figure 3.4). However, they may range in intensity from slight tremors to great shocks, and may last from a few seconds to as long as five minutes. Shocks could come in a series over a period of days.

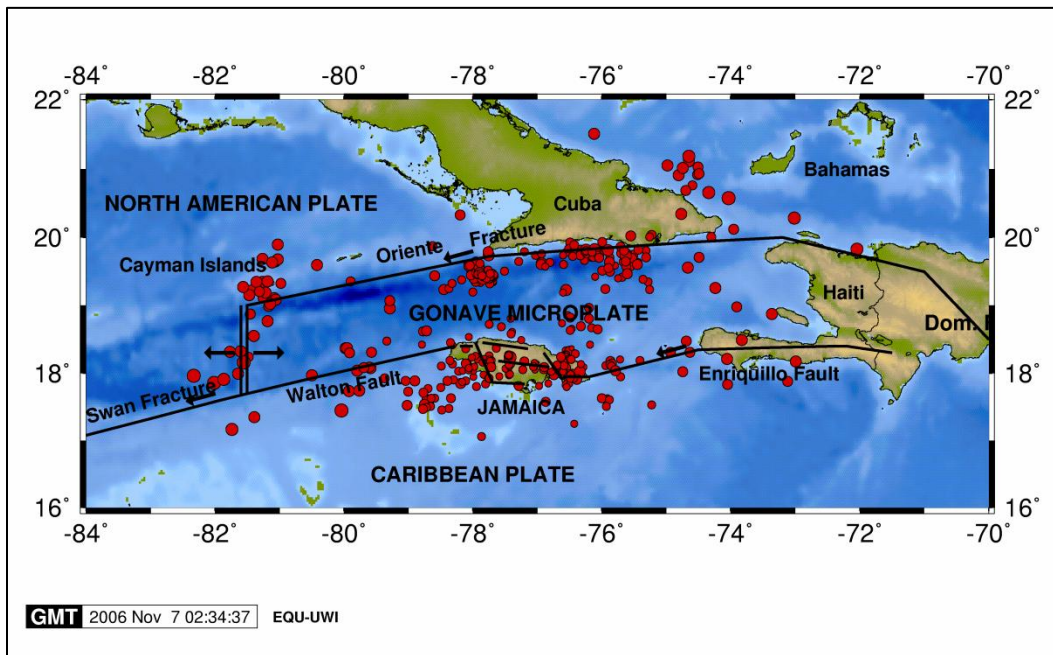


FIGURE 3.4: ENRIQUILLO FAULT – PLANTAIN GARDEN FAULT (RED DOTS REPRESENT PAST EARTHQUAKES)
 (SOURCE: UNIVERSITY OF THE WEST INDIES. EARTHQUAKE UNIT, 2007)

During an earthquake, injury and death to persons may be caused by falling objects and collapsing buildings. Disruption of landline communications, light and power lines and sewer or water mains can be expected. Earthquakes can also trigger secondary hazards such as fires.

In the event of an earthquake, the project design, construction and operational phases must put in place a prevention and mitigation plan to avoid and/ or combat possible impacts arising from this hazard.

3.1.7 WATER RESOURCES

No receiving water bodies were identified in the project area. In Kingston all properties are required to mitigate storm water within their own boundaries by way of drainage wells. There is no public storm water system to convey the waters.

Based on the topography, it is assumed that stormwater infiltrates within the site, and any excess during a heavy rainfall runs off to the south-west corner where the level is lower, and overflows to the kerb and channel.

In terms of water supply, Kingston is supplied by surface water through rivers which feed into two major reservoirs: Hermitage and Mona (See Figure 3.5-3.6). Currently the National Water Commission (NWC) has a water supply capacity of 18 million gallons per day for which only 60% of this is used daily. NWC also indicated that they have a Drought Contingency Plan which has the capacity to supply water for 2 months into a drought to meet the Kingston water demand.

In considering the severe 2009-2010 drought that Kingston experienced, NWC has developed a long term plan to increase daily capacity to 60 million gallons per day through an upcoming project.

Based on discussions with the NWC, they have indicated that the needs of the Courtyard by Marriott Hotel in Kingston, Jamaica can be met

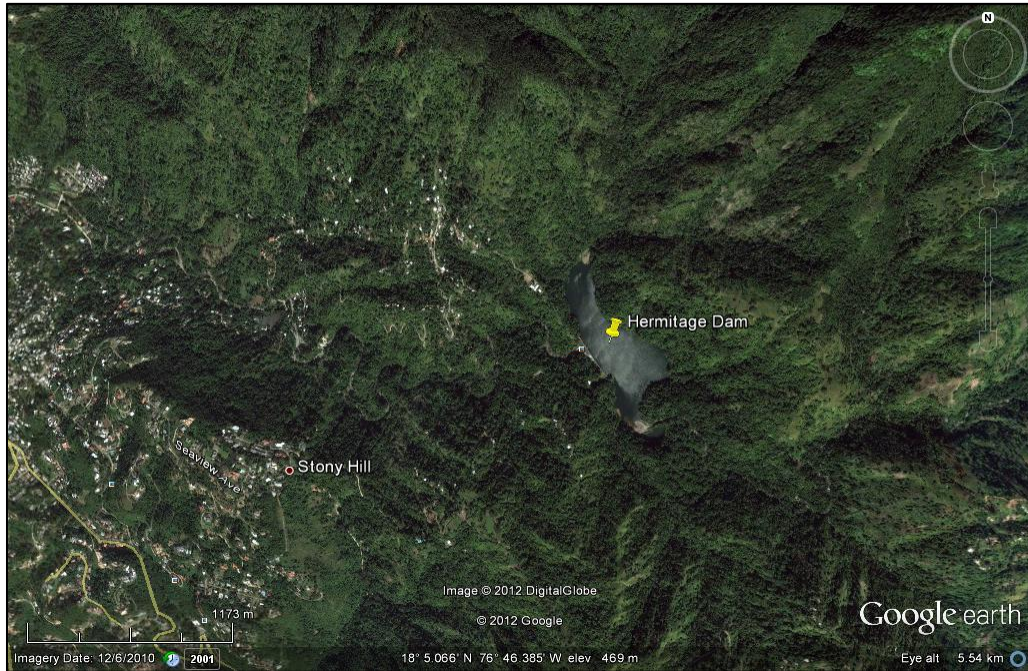


FIGURE 3.5: HERMITAGE DAM

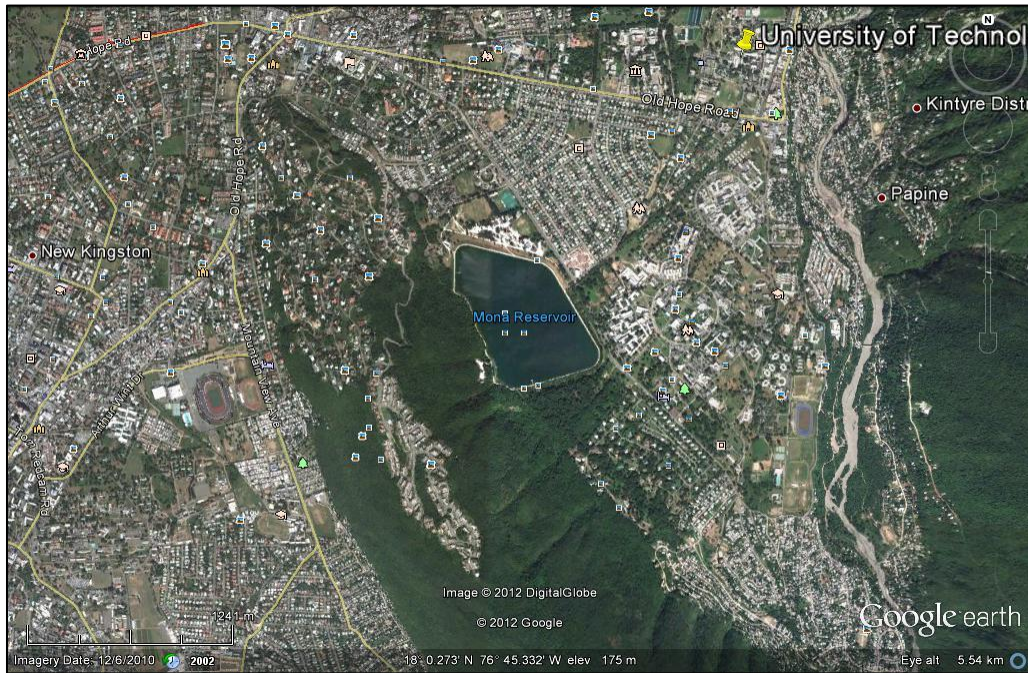


FIGURE 3.6: MONA RESERVOIR

Project Sphere of Influence

Figure 3.7 below illustrated the project location on a 1: 50 000 topography map and the project sphere of influence which include New Kingston and its immediate environs.

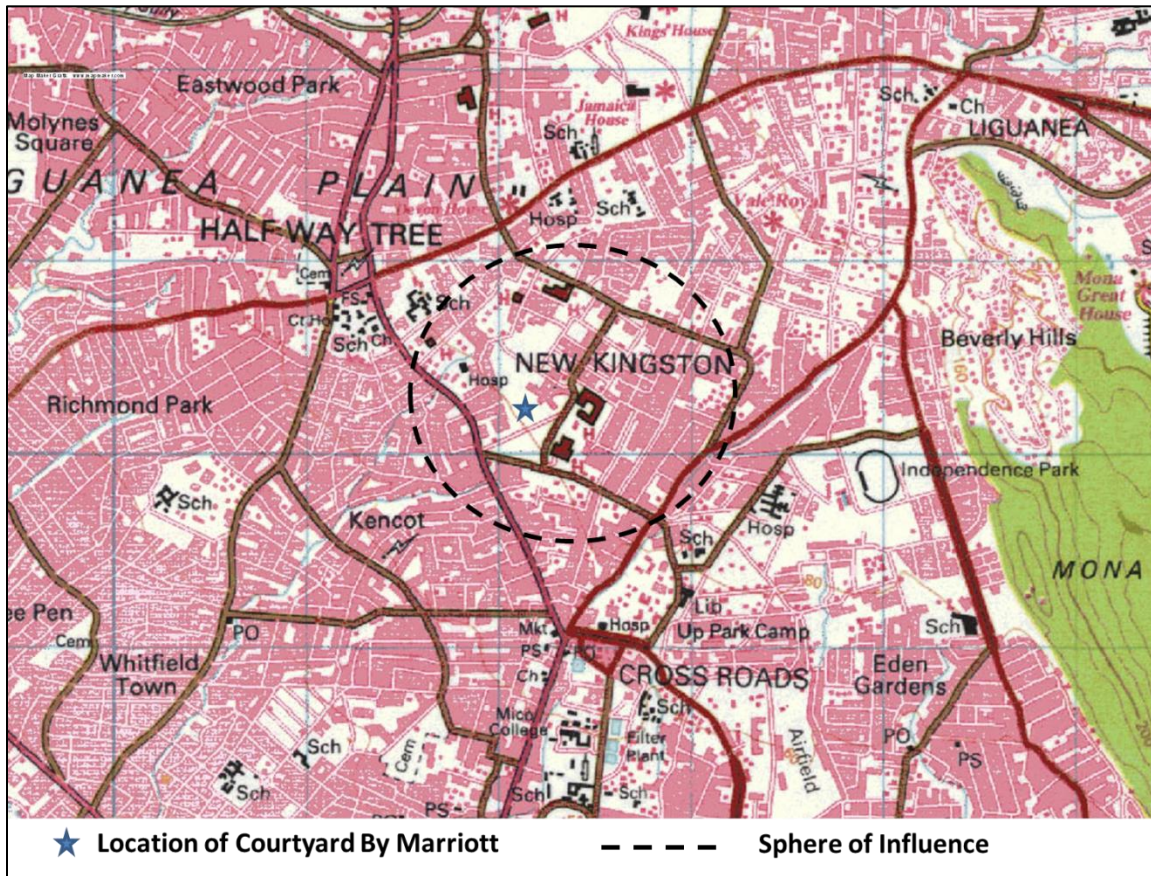


FIGURE 3.7: 1:50 000 TOPOGRAPHY MAP OF PROJECT SITE LOCATION AND SPHERE OF INFLUENCE

3.2 SOCIAL AND COMMUNITY SETTING

The project site is located in the area of New Kingston which is in the Parish of St. Andrew. The 2001 data from the Statistical Institute of Jamaica (STATIN) is the most recent data collected and collated for Jamaica that is available for use. A population census was conducted in 2011; however, this data has not yet been published. The 2001 data has been used for a detailed evaluation of the social and community setting along with field visits which included observation and informal interviews. The map below illustrates the boundaries for the Special Area of New Kingston as designated by STATIN (Figure 3.8).

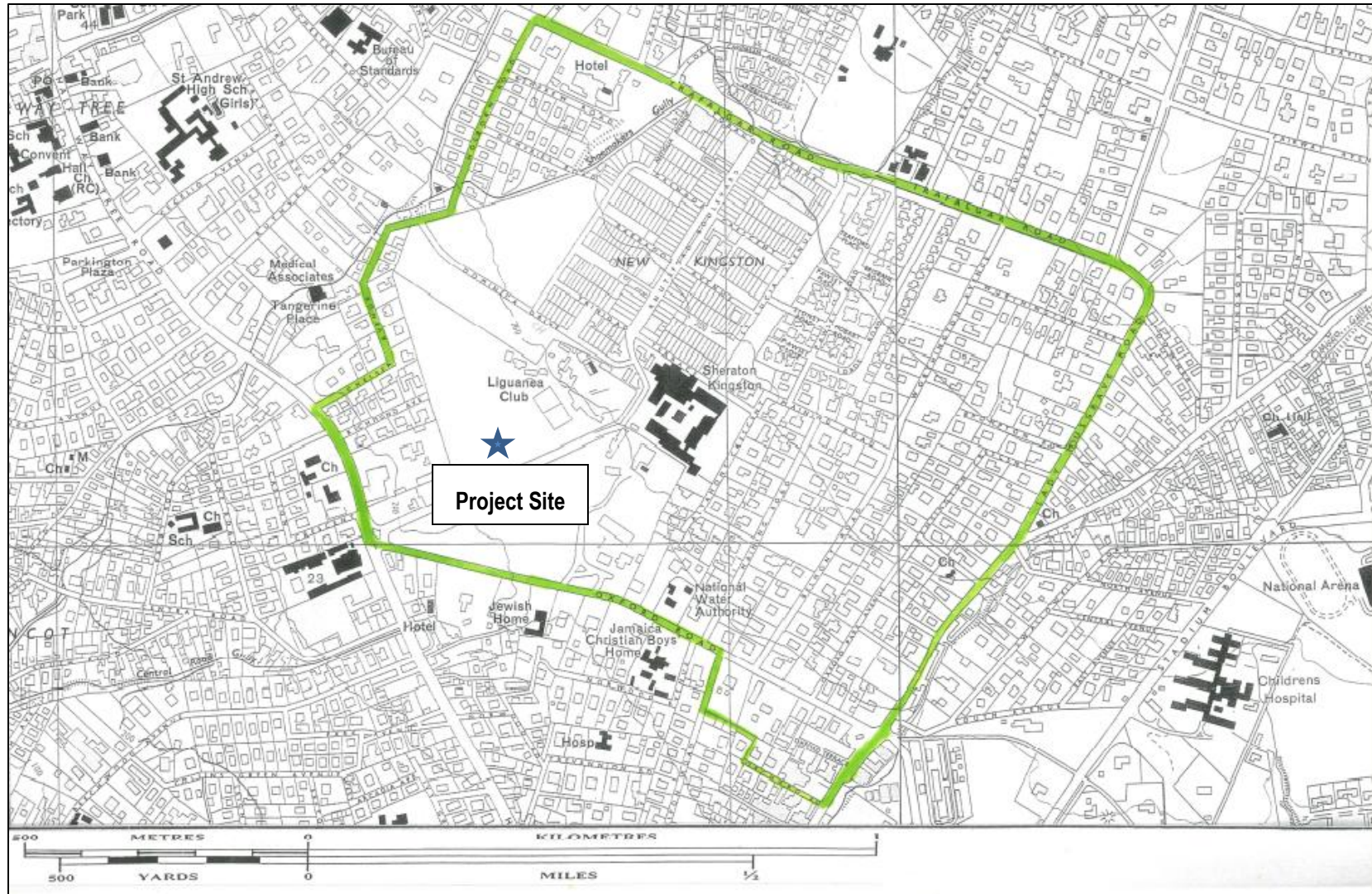


FIGURE 3.8: BOUNDARY OF THE SPECIAL AREA, NEW KINGSTON (SOURCE: STATIN)

Population and settlement patterns

New Kingston has an average population of 820 persons and the parish St. Andrew, a population of 555, 827 persons. New Kingston is situated in urban St. Andrew and it is a special area designated by STATIN hosting both residential and commercial features.

73% of the population of New Kingston falls within the working class age group (15 to 64 years) (Figure 3.9). The 0-14 and over 65 constitute 19% and 8% respectively.

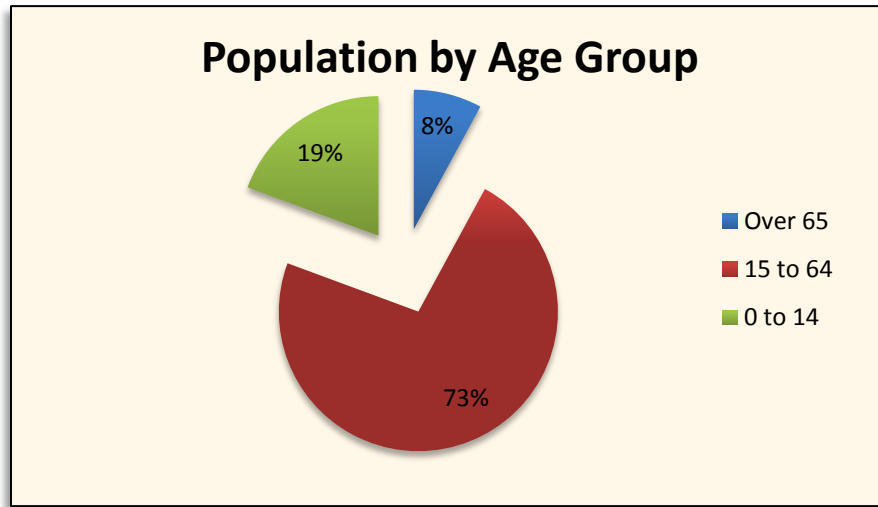


FIGURE 3.9: POPULATION OF NEW KINGSTON BY AGE GROUP

STATIN 2001 census data does not breakdown population data related to education and disability beyond the parish level. For the parish of St. Andrew, 14% are disabled. Figure 3.10 below illustrates this disabled population by specific chronic illnesses. It is evident that Asthma is the most common chronic illness. It can therefore safely be said that Caribe Hospitality must ensure that air quality is monitored during construction to ensure that ambient air quality meets the required standards.

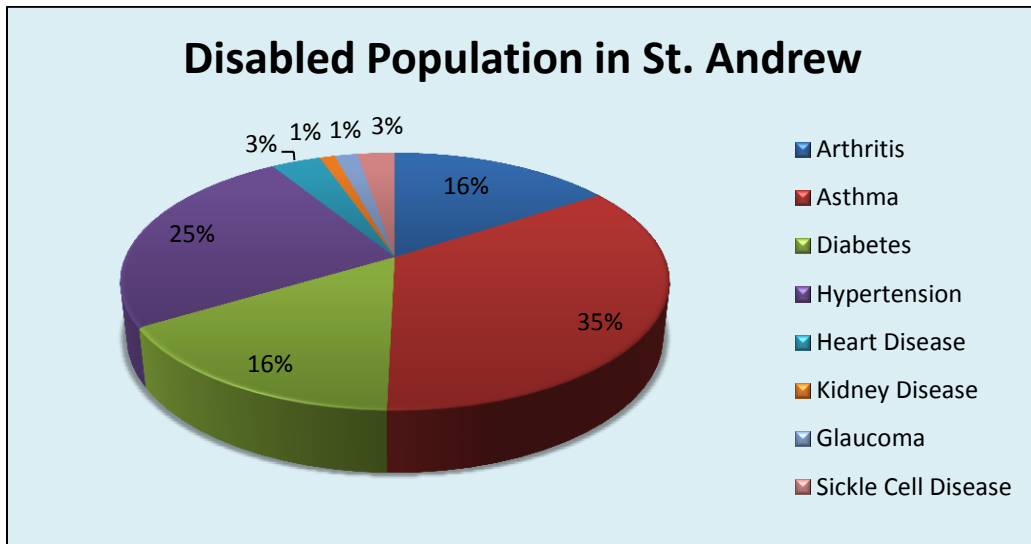


FIGURE 3.10: CHRONIC ILLNESSES OF THE DISABLED POPULATION IN ST. ANDREW

Based on the parish data for St. Andrew, the population over 15 years is approximately 19,668. An approximate 67% of this population do not have any form of educational/vocational training, 29% have diplomas and certificates and 2% have degrees and professional qualifications (Figure 3.11). One limitation associated with parish data is that it may not truly represent the status of the population within specific areas.

The Heart Trust NTA is located along Oxford Road which borders the New Kingston area. Vocational training is available at this institution for various skills. Furthermore, the project would require the availability of construction trade workers to form part of the labour force during construction. This means that persons within the area that meet the selection criteria could apply for employment on this project.

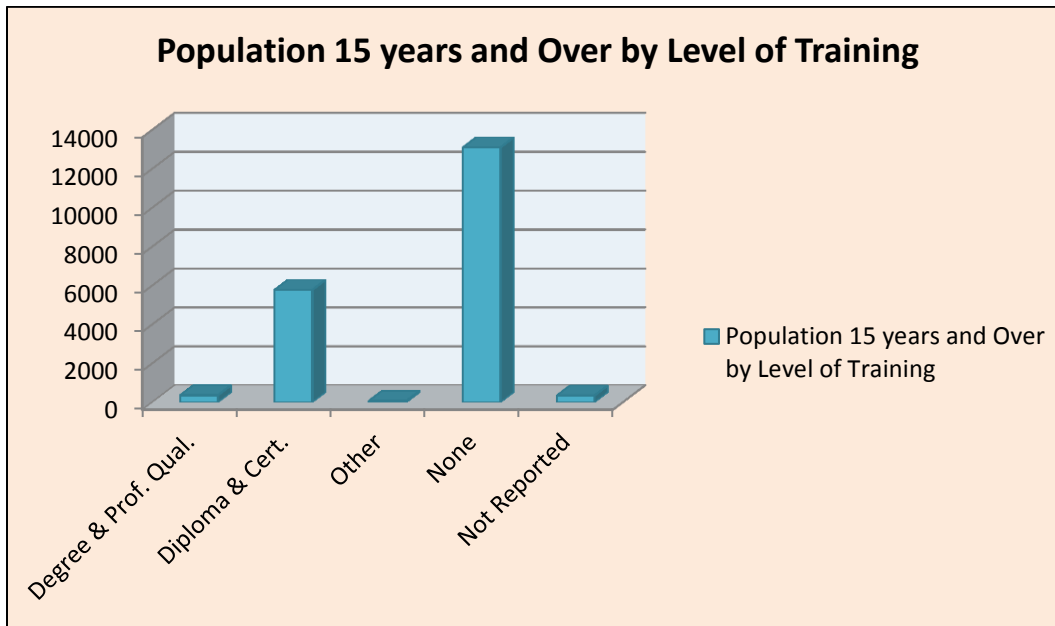


FIGURE 3.11: POPULATION 15 YEARS AND OVER BY EDUCATION LEVEL

Housing

The area has a total of 231 residential housing units, 97% of which are made from concrete including blocks. Although there are 231 residential units, 872 dwellings exist and an approximate 43% of which are owned and 49% rented (Figure 3.12). No squatters were recorded for this area.

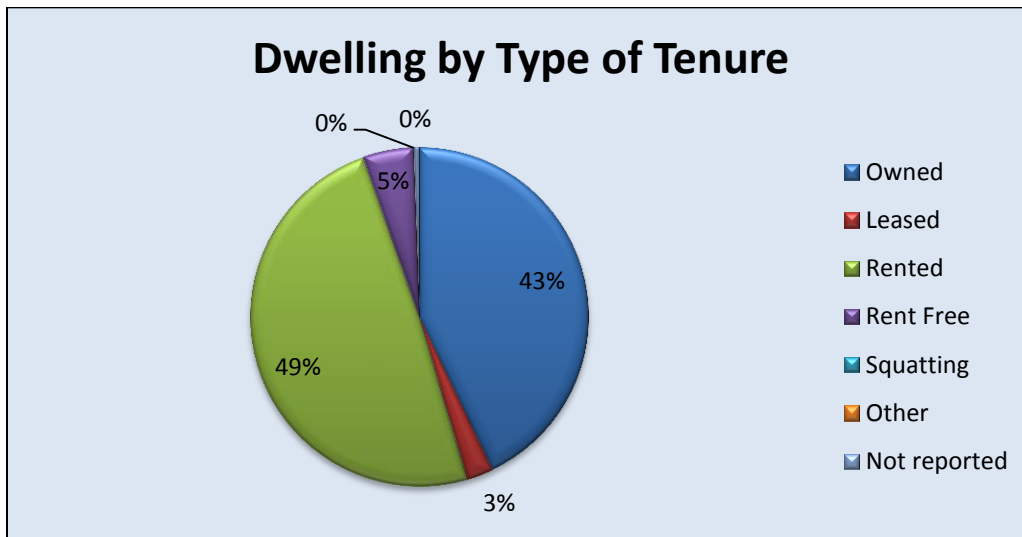


FIGURE 3.12: DWELLINGS BY TYPE OF TENURE

Of the total dwellings, 15% are separate units and 85% are attached (Figure 3.13). This reflects the fact that several apartment complexes exist in the area (Plate 3.2).

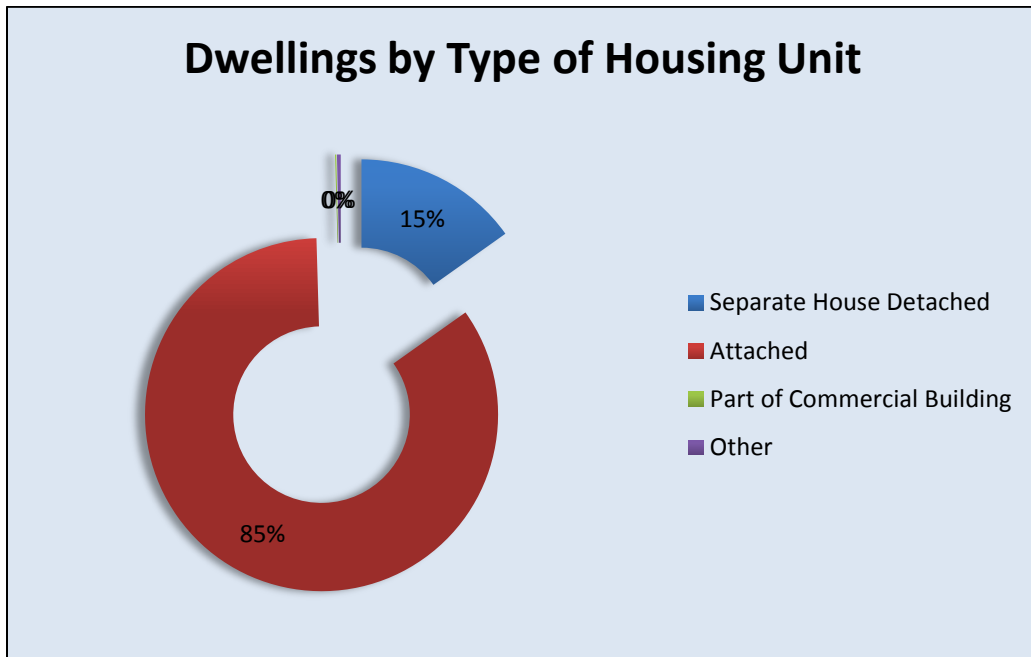


FIGURE 3.13: DWELLINGS BY TYPE OF HOUSING UNIT



PLATE 3.2: APARTMENT COMPLEXES IN NEW KINGSTON

Social Infrastructure

The services of potable water supply and sewer connection are supplied to the New Kingston area by the National Water Commission. 99% of dwellings had a public source of water piped into their dwellings.

Of the total households, 94% had a private water closet that is not shared and 4% had a shared water closet. 0.7% reported the use of a private pit facility. There were no records of persons having no toilet facility in the area.

Street lighting is adequate and electricity is available to the dwelling through the Jamaica Public Service Company Ltd. Households have available to them both electricity and gas options for cooking (Figure 3.14).

The data reveals that public utilities are available, and utilised within the New Kingston area.

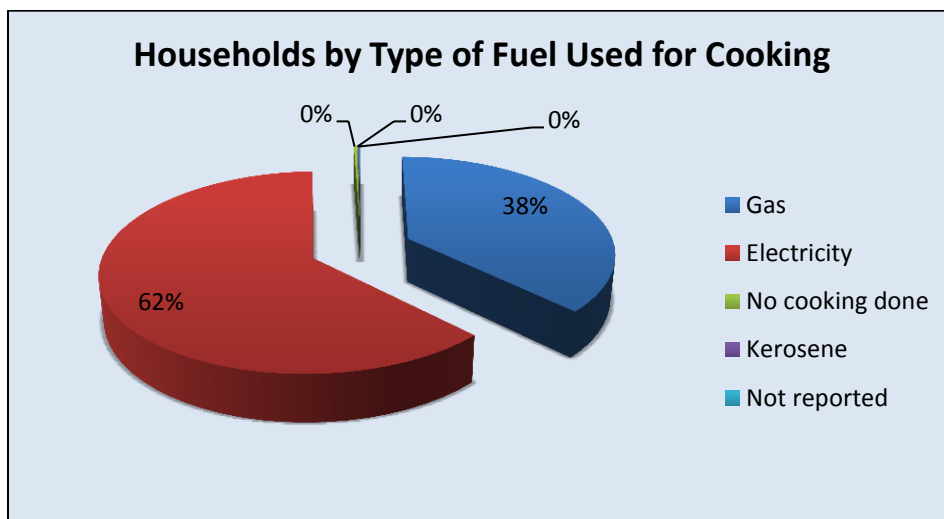


FIGURE 3.14: HOUSEHOLDS BY TYPE OF FUEL USED FOR COOKING

The interior network of roads in New Kingston is paved and in fairly good condition. The community is also equipped with an active public transportation route for both buses and taxis (Plate 3.3 and Figure 3.15).



PLATE 3.3: KNUTSFORD BOULEVARD, MAJOR TRANSPORTATION ARTERY IN NEW KINGSTON

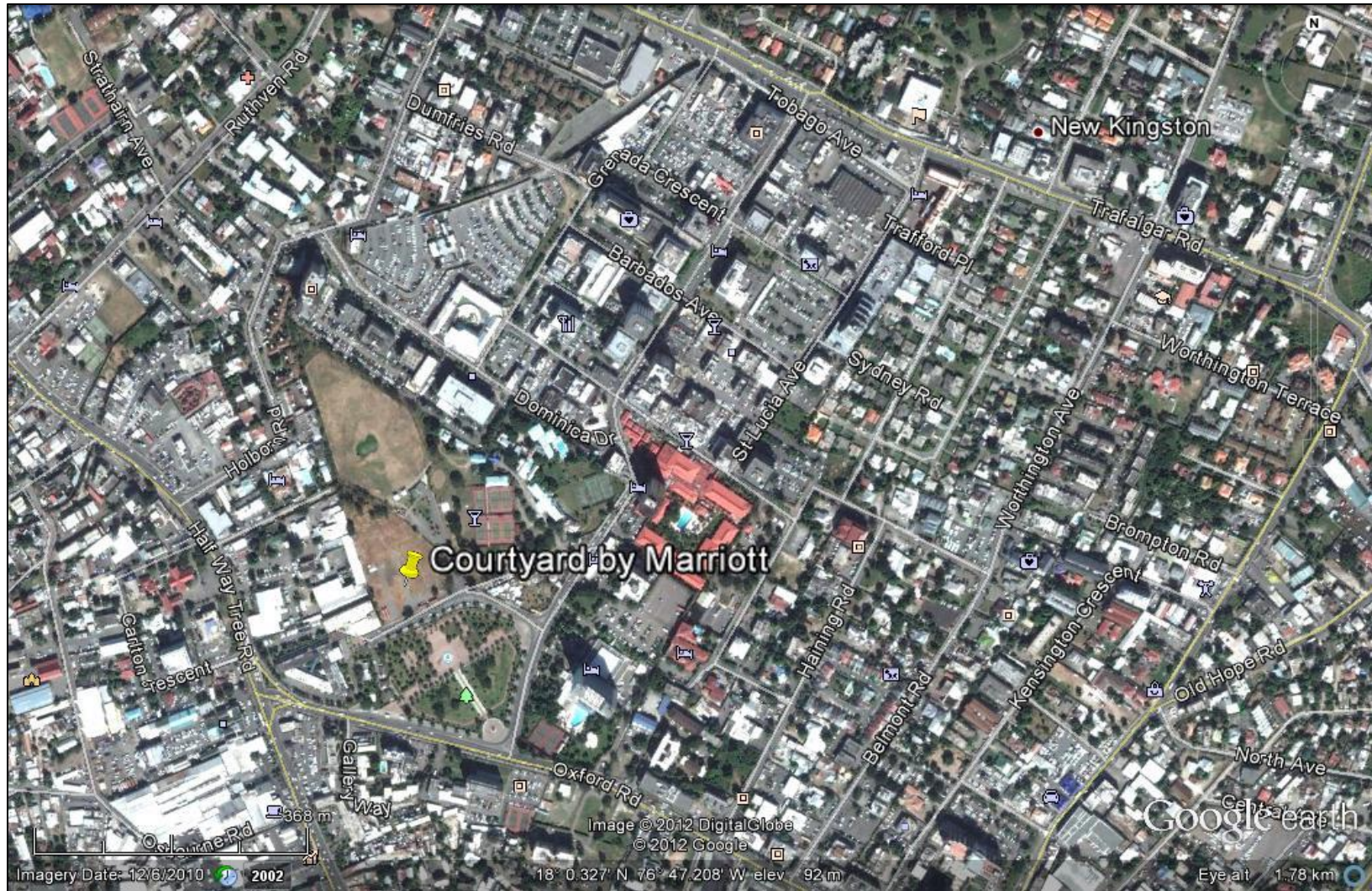


FIGURE 3.15: ROAD NETWORK OF NEW KINGSTON

Residents and commercial entities have the benefit of garbage collection through the National Solid Waste Management Authority. Some commercial entities utilize private collectors based on the size of the entity.

Several schools and churches fringe the border of the New Kingston area which also serve the New Kingston population. Some of these are:

1. University College of the Caribbean
2. St. Andrew High School of Girls
3. St. Andrew Preparatory School
4. Ardenne High School
5. Webster Memorial United Church
6. Swallowfield Chapel

Several other social facilities within and surrounding the New Kingston area includes: a recreational park (i.e. Emancipation Park), the Jamaica Christian Boys Home, and health services such as the Jamaica Cancer Society, Medical Associates Hospital, other clinics and dental services.

Local infrastructure serving the New Kingston area is overall good.

Economic Activity

The western section of New Kingston is characterized by several economic activities while the eastern area of New Kingston is largely residential. Figure 3.16 below shows the project site and its immediate surroundings with economic activities. The locations numbered in red balloons in Figure 3.16 correspond directly to the numbered economic activities listed below:

1. Emancipation Park on the southern boundaries of the site
2. National Housing Trust on the western boundary of the project site
3. The business complex of the Richmond Park Great House on the west boundary which hosts business such as:
 - Jamaican Historical Society, Richmond Park Great House
 - General Accident Insurance
 - Crichton Insurance Agency
 - Musson (Ja) Ltd
 - Dental Associates
 - Productive Business Solutions
 - Tingrinner Club Jamaica
4. Taxi operators along Park Boulevard and Park Close
5. The Sweetwood Jerk Restaurant east of the site
6. Sunrise Amusement Park, formerly Putt N' Play Amusement Park east of the site

7. The Liguanea Club east of the site



FIGURE 3.16: PROJECT SITE AND SURROUNDING ENTITIES

Several other business hotels are located in the vicinity of the project site. These are below in Figure 3.17 below.



FIGURE 3.17: HOTELS IN NEW KINGSTON

The business district of New Kingston includes: banks, insurance companies, real estate businesses, other financial institutions, stores, shopping centres, restaurants, clubs, Government ministries, public utility offices, and many other types of business entities. These activities are common in urban St. Andrew and are closely linked to the main livelihoods for persons living in the Kingston Metropolitan Region.

The project is not likely to have a significant impact on the residences of New Kingston. There is no residential housing within the immediate vicinity of the project site; this means that immediate issues with respect to dust and noise are likely to affect the business community of New Kingston.

In summary, the social assessment of the community indicates that New Kingston is developed and is equipped with all essential infrastructure.

Benefits from Courtyard by Marriott, Kingston Jamaica

Caribe Hospitality intends to engage a local contractor to construct the hotel based on the approved designs. The local contractor will hire several workers from the corporate area during the construction phase of the project. Caribe Hospitality also plans to employ some local persons from the corporate area who meet the job criteria for various positions during the operation of the hotel.

A normal distribution between local and non-local employees will be hired, that is 85% and 15% respectively. In addition, the distribution between men and women will be 50%:50%.

Other benefits from this project include the employment of Marriott's Corporate Social Responsibility programme during operation. The construction of this hotel will increase room availability for Kingston.

Archaeological /Cultural Resources

The project site is not a "Cultural site" by definition of the IDB policy¹ and has no status i.e. World Heritage etc. Furthermore, no unique historical features have been identified on the project site.

Should there be an unexpected discovery of any artefact or thing that may be of historical value during excavation; this will be reported to the Jamaica National Heritage Trust (JNHT). JNHT will then respond by conducting a site assessment and report their findings and recommendations to the client.

¹ "Cultural sites are any natural or manmade areas, structures, natural features and/or objects valued by a people or associated people to be of spiritual, historical, and or archaeological significance. Material remains may be prominent, but will often be minimal or absent." (Sustainable Development Department, 2007 p. 42)

4.0 ENVIRONMENTAL AND SOCIAL IMPACTS AND RISKS

This section identifies and describes all environmental and social impacts and risks associated with the proposed construction and operation of the hotel taking into consideration direct, indirect and cumulative impacts.

4.1 CONSTRUCTION PHASE

Construction Activity is divided into two phases. Phase I includes the site cleanup, grading and stormwater infrastructure and Phase II is the building construction phase.

Phase I

Phase I is expected to last a period of one month.

The best management practices as listed below will be employed during Phase I:

1. The construction of a truck wheel cleaning area
2. The construction of protection fences in designated areas to prevent unauthorised entry of persons
3. The construction of silt fences in designated areas
4. The construction of diversion berms in designated areas
5. Dust control will be undertaken by irrigation in the dry season
6. Sediment control will be employed during the rainy season by means of temporary sediment traps and silt fences within the site boundaries
7. Drains will be protected
8. Trucks and machinery would be controlled and cleaned when exiting the site

Phase II

Phase II, the building construction phase is expected to last 18 months. The best management practices to be used during this phase are as follows:

1. Dust will be controlled by irrigation during the dry season
2. Sediment control during the rainy season will be undertaken by means of temporary sediment traps and silt fences along site boundaries.
3. Drains will be protected
4. Trucks and machinery will be controlled and cleaned when exiting the site
5. Noise levels will be monitored to ensure that levels are under the limits to be approved by NEPA
6. All storm water will be directed to the storm water system

7. The work area will be limited with fences and signage
8. All erosion and sedimentation measures will be maintained and replaced

There are no significant slopes that will require temporary stabilization on site; however, final stabilization of minor slopes will be done by landscaping.

4.1.1 NATURAL HAZARDS

As discussed in Section 3.1.6 above, the Courtyard by Marriott hotel, Kingston Jamaica is exposed to natural hazards. The project has incorporated considerations for hazards in the design, construction and operation phases.

The project site can experience wind conditions greater than 248km (155mph) based on wind speeds of a Category 5 hurricane. The site is not located in a flood prone area nor is it in the vicinity of any natural drainage routes. However, the soil test results indicate the low permeability of the site, which means that infiltration does not occur readily beyond about 13 metres. With this reality there can be potential flooding on site if there are long periods of torrential downpour. With this in mind, the developer plans to construct an underground storm water retention pond to the appropriate depth to hold water temporarily from heavy rainfall.

As already stated in section 3.1.5, the soil investigation concluded that according to the International Building Code (2009), the project site can be classified as site Class D with mapped spectral acceleration for short periods, $S_s=0.62g$ and one second periods, $S_1= 0.27g$ for an earthquake with a 2% probability of exceedance in 50 years. Additionally, in the event of an earthquake, liquefaction is not expected on site. Designs for seismicity and wind loading have followed the stipulations of the Building Code.

The terms and conditions of the Environmental Permit issued for this project stipulates that an Emergency Response Plan and an Evacuation Plan be developed and submitted to the Office of Disaster Preparedness and Emergency Management (ODPEM). The client will prepare and submit this document for approval by ODPEM prior to construction and operation of the hotel.

4.1.2 ALTERATION AND/OR REMOVAL OF NATURAL HABITATS AND CULTURAL SITES

There are no sensitive habitats or species on or near the project site. The project site is immediately north of the constructed Emancipation Park.

Note also that the project site is not under any national or international environmental protected area, such as: Important Bird Area (IBA), International Union for the Conservation of Nature (IUCN), Ramsar Site (for wetlands), National park or Nature Reserve.

There are no historical sites or features on or near the project site to be considered.

4.1.3 SOLID AND HAZARDOUS WASTE

Caribe Hospitality of Jamaica Ltd is expecting approximately on 18m³ container of solid waste per week during the construction phase. Solid waste would be typical of that experienced on a construction site: wood, steel, concrete, dirt, packaging, and waste associated with meals, just to name a few.

Practices such as waste disposal, recycling, proper handling of materials and cleaning measures can reduce the potential risk of runoff drag of garbage or hazardous materials.

Improper storage and handling of solid wastes can allow toxic compounds, oils and greases, heavy metals, nutrients, suspended solids and other contaminants to be mixed with water from surface runoff.

To prevent any of the above negative impacts from improper waste disposal practices, the following general waste management protocol adopted as part of the Stormwater Pollution Prevention Plan (SWPPP) will be employed for this project. The SWPPP is template published by the United States Environment Protection Agency (USEPA) as a guide for construction sites. The SWPPP have been made specific to the project site and has been presented in Appendix V of this report. The following are guidelines that will be followed during construction.

- Designate a waste collection area, where a container can be kept for the collection of site waste.
- The waste container will be coated with a waterproofing material to prevent the escape of fluids. It will be covered with a lid or with a black plastic membrane to prevent rain water from flooding the waste and overflow the container. The stored waste will always be covered.
- Waste containers will be checked weekly to ensure there are no leaks of fluids. Any container that presents output of fluids, corrosion, or damage in any way will be replaced.
- Garbage containers will be covered all the time.
- Waste storage areas will be swept and cleaned regularly. Hose washing will not be used in the cleaning process.
- The soapy water resulting from the cleaning of the garbage storage area will be drained to NWC sewer main, never to the storm drain system.
- If a bin is damaged, the contents will be transferred to another container in good condition.
- The project team will ensure that the garbage collection process by the collecting truck does not release fluids and that lightweight material is not blown away.
- A sufficient number of containers will be provided on site to deposit the waste within the construction zone.
- Containers will be cleaned daily or as often as required.
- Garbage storage area will always be kept clean.

- The filling of waste containers with wash water or other liquid will be avoided.
- The project team will ensure that solid waste placed in containers is appropriate for landfill treatment. Some hazardous wastes such as fluorescent lamps, pesticides, etc. require special treatment. Consultation will be made to the company responsible for collection and transportation of waste products.
- Any leaks will be remedied and contained immediately.

Solid waste from the site will be collected by the licensed/ Certified Garbage collection company and trucked to the Riverton Disposal Site.

4.1.4 OCCUPATIONAL HEALTH AND SAFETY

Physical hazards to construction workers include falling from heights, impact with moving machinery, and injuries from handling equipment and construction materials. The local contractor will be required to comply with Caribe Hospitality's Environmental Social and Health Management System which includes provisions for worker health and safety. These provisions are outlined in their Occupational Health and Safety Manual as follows:

1. Legal provisions
2. Delineation of areas and infrastructure for the project
 - a.) Limits of the project
 - b.) Infrastructure
3. Provision of services for the project
 - a.) Drinking water
 - b.) Electricity
4. Build and maintain temporary electrical installations
 - a.) Electrical interim
 - b.) Maintaining temporary electrical installations.
5. Temporary Facilities
6. Managing Employee Health
7. Housekeeping
 - a.) Possible sources of infection
 - b.) Work areas and transit
 - c.) Workshops
 - d.) Storage of materials
 - e.) Management of waste

8. Personal Protective Equipment
 - a.) General Attire
 - b.) Personal Protective Equipment (PPE) Basic
 - c.) Specific Protective Equipment
9. Smoking, drug and alcohol
 - a.) Smoking
 - b.) Drug Use
10. Signage
 - a.) Differentiation of zones
 - b.) Marking of areas with high noise levels
 - c.) Labeling
 - d.) Use of colors
11. Chemicals
 - a.) Chemical storage and transfer
 - b.) Emergency and Spill
 - c.) Disposal of packaging and remnants
12. Emergency Care
 - a.) Emergency and accident response
 - b.) Report of accident or emergency situation
 - c.) Respond situation
 - d.) Treat injuries with first aid
 - e.) When the accident is serious,
 - f.) Return to normal
 - g.) Investigate an accident or emergency

The Occupation Health and Safety Manual also includes an Occupational Safety Plan for the project which establishes: the project risk level, planning SSO management in the project, commission, planning for security in the work of subcontractors, control and monitoring plan, and planning for emergencies. Safety planning is also done for construction activity and includes an Occupational Safety Plan for Construction Activities (PSOAC) and a Daily Work Plan (DWP).

Caribe Hospitality of Jamaica Ltd. will comply with the necessary safety precautions during construction as outlined above.

4.1.5 LABOUR AND WORKING CONDITIONS

An estimate of 200 workers would be employed during the construction phase. Working conditions namely, wage rates and working hours would be as stipulated by the Joint Industrial Council (JIC). This was already indicated in Section 2.1.4. Workers will also be allowed standard lunch breaks. Other considerations include:

- Adequate compensation for over-time work;
- Drinking water will be made availability on site;
- A grievance mechanism and stipulations regarding equitable employment/ working practices would be in place as stipulated by Caribe Hospitality's Environmental Social and Health Management System;
- Collective labour contracts would be made available;
- Additional benefits (e.g., meals, access to medical care, etc.) would be made available for workers if necessary.

4.1.6 SOCIOECONOMIC IMPACTS

Based on the socioeconomic assessment completed in Section 3.2, Courtyard by Marriott is expected to be a business hotel added to the business district New Kingston. The most significant impact could possibly include dust and noise nuisance that would affect persons who work or conduct business within the immediate vicinity of construction; taxi operators; and visitors to Emancipation Park.

During construction requirements have already been outlined by the Terms and Conditions of the Environmental Permit issued from National Environment and Planning Agency (NEPA) for monitoring these nuisances. Provided that these monitoring details are followed, it would include the development of an Environmental Management Plan to guide this construction phase.

The Environmental Permit from NEPA also requires that a Traffic Management Plan be completed for the construction phase of the development and submitted to the National Works Agency for approval. This plan should address potential challenges that might arise with respect to access to main roads, in particular, Knutsford Boulevard and Park Boulevard.

Caribe Hospitality Jamaica Ltd has put plans in place to address potential nuisance to the surrounding community from the generation of dust and noise, as well as, the movement of heavy machinery and trucks at the site based on guidance provided in the Storm Water Pollution Prevention Plan as outlined in Appendix VI.

During construction, Caribe Hospitality's procedures for grievance will be in place, according to its Environmental Social and Health Management System. The local liaison for this process will be the local Project Manager, Jamaica Property Company Ltd.

Jobs would be advertised prior to construction and operation so the locals would have a fair opportunity to be employed. It is also anticipated that the public will also be notified when construction would start and when operations would begin prior to opening dates.

During construction, the contracted construction company will be in charge security on the project site. They will implement the normal practices regarding security in the island.

4.1.7 OTHER ENVIRONMENTAL AND SOCIAL IMPACTS AND RISKS

The effect of construction on air quality as indicated above relate largely to the potential for dust nuisance. Once this is adequately mitigated as indicated above this should not be a problem. There are no natural or drainage features on or near to the project site and there are no sensitive habitats or species, therefore, issues related to water quality, hydrology, and biological resources do not exist.

There are no cultural or archaeological features on the site and so there are no impacts related to these aspects.

4.2 OPERATIONS PHASE

4.2.1 WASTEWATER GENERATION AND DISPOSAL

Approximately 590,000 gallons per year of waste water is expected to be generated during full occupancy. This waste water will be in its primary state, with respect to its quality. Waste water is expected to be generated from bathrooms, kitchen/restaurant, and laundry. Untreated waste water will be collected and channelled to the National Water Commission's public sewage main for treatment.

Note that the Brac grey water recycling system will be installed and utilised as already described in Section 1.3.3 above. The Brac system would include the construction of a Brac System tank to collect waste water from showers, baths and laundry, filter it and reuse it for the toilet's evacuation system. The recycled water (i.e. grey water), is used only for the toilet or for irrigation, and cannot get in the drinking-water system

An underground storm detention pond has been proposed for construction to control storm water runoff from the site. This pond is expected to collect surface run off from the project site during periods of heavy rainfall. After heavy rain, the water will be discharged into the main drains intermittently to reduce the potential for flooding. The geotechnical reports indicate that the permeability of the site is low and this measure is expected to assist in controlling runoff and preventing flooding on and around the project site. This was previously discussed in detail in Section 3.1.7.

4.2.2 WATER SUPPLY AND USE

Approximately 982,000 gallons of water per year is expected to be utilised during full occupancy. This water will be utilised by guest rooms, kitchen/restaurant, and laundry. This will be supplied by the National Water Commission, which is the main supplier of water in Jamaica.

Section 3.1.7 above outlines water resources that supply the Kingston area. Based on these details, Jamaica has enough water for present and future demand.

The National Environment and Planning Agency (NEPA) issued an Environment Permit to the project developer. This permit incorporates requirements from several agencies including the Water Resources Authority (WRA) which is responsible for regulating water resources in Jamaica and the National Water Commission (NWC) which is the main institution responsible for water supply and sewerage operations. These government agencies are a part of NEPA's Internal Review Committee which is that body responsible for determining the grant of a permit. These agencies would have reviewed the details of the project and have included any specific requirements of the client in the terms and conditions of the permit.

Water conservation opportunities will be utilised within the project design in order to meet LEED certification criteria. These can include measures such as the installation of low-flow fittings for toilets, faucets, showers, and laundry and kitchen equipment in preparation for the operation phase. Furthermore, the installation of the Brac system for grey water recycling already discussed in Sections 1.3.3 and 4.2.1, is also expected to conserve on water supply.

4.2.3 INVASIVE SPECIES

There are no invasive species on site and no invasive species will be introduced by the project in their landscape plan.

4.2.4 ENERGY SUPPLY AND USE

Electricity will be supplied to the hotel by the Jamaica Public Service Company Ltd. (JPSCo). There are opportunities for energy conservation measures to be incorporated into the project design. Opportunities exist for the incorporation of high efficiency lighting and equipment, motion sensors, and heat recovery from generators or air conditioning systems for water heating. Caribe Hospitality of Jamaica Ltd. plans to implement energy conservation measures to meet LEED silver certification requirements.

Measures to be implemented include the use of high performance chillers for the heating and ventilation and air conditioning (HVAC) system. Chillers are among the most complex and energy-intensive pieces of equipment in institutional and commercial facilities. The installation of high performance chillers will ensure that these chillers operate efficiently. Furthermore, the performance of installed chillers would be monitored to ensure that chillers continue to operate at peak efficiency.

Another means of energy conservation is the installation of the heat recovery wheel to precool fresh air. This would reduce the stress on air conditioning systems in maintaining a cool building. Furthermore, high performance windows and building envelope insulation would be installed to comply with ASHRAE 90.1 standards. The ASHRAE 90.1 standard was previously discussed in Section 1.3.3. The concrete walls will be constructed with a layer of insulation and gypsum board on the inner-walls to decrease the load on the Air Conditioning System. This system recovers cooling from exhaust using an enthalpy wheel back into space.

Other energy conservation measures include the installation of LED light fixtures in some locations. Occupancy sensors would also be installed in guestrooms to offset the HVAC set point during periods when rooms are un-occupied.

Solar heat collectors would also be installed to pre-heat water.

There are occasions where JPSCo has planned and unplanned power outages. These do not occur readily but may occur if the company experiences any technical difficulties. Should a power cut occur, the project site will be equipped with an emergency generator to provide 100% back-up of the electricity usage for the hotel, that is, approximately 600 KVA.

4.2.5 AIR EMISSIONS

A 600KVA stand-by generator would be installed on site to provide 100% power back-up in the case of a power outage from JPSCo. The emissions from the generator will vary based on the model and size of the choice and this has not yet been decided. It is important to note that the generator will not be running continuously.

4.2.6 SOLID WASTE

During operation, approximately two 6m³ containers are expected to be generated per month during full occupancy. Solid Waste would be collected and disposed of at the Riverton Disposal Site.

Solid waste is expected to be generated from guest rooms, kitchen and restaurant facilities, as well as grounds. Solid waste collected will not be sorted on-site but would be removed from skips to the designated disposal site.

4.2.7 HAZARDOUS MATERIALS

An aboveground fuel storage tank will be present on site to support the generator that will provide back-up power during periods when JPSCo has power outages. The generator will have a sub-base diesel tank underneath, within a containment pond to catch leaks if this should develop. The aboveground tank would

be properly constructed and double walled. The tank will have an automated system to detect leaks. Regular integrity tests would also be conducted by the client to ensure this is safe. This will reduce the potential for unplanned discharges and contamination.

Based on the size of the tank, the local regulatory body, NEPA, does not require the submission of an Environmental Permit for tank sizes less than 4,000 litres or 880 gallons.

Hazardous materials, such as pesticides for landscaping purposes and disinfectants for swimming pool may be utilised on site. If these are utilised, they would be properly stored and disposed of, as outlined by the manufacturers.

Other hazardous materials are not expected to be utilised on-site during operation. Furthermore, no medical facility would be located on-site and therefore no medical waste would be on-site.

4.2.8 LIFE AND FIRE SAFETY/EMERGENCY RESPONSE PLANNING

An emergency response plan will be set up during operation based on the Caribe Hospitality's Environmental Social and Health Management System.

A fire alarm and fire extinguishers and pumps would be installed throughout the hotel based on local and international standards, in particular, the National Fire Protection Association NFPA-101 (Life Safety Code) and NFPA-13 (Sprinklers). The local fire brigade, as a part of the local building design approval process also reviews building designs and makes recommendations prior to building approval. Location of fire extinguishers would be identified and mapped. Inspection of fire extinguishers and training are also a part of the emergency plan within the Environment Social and Health Management System.

Courtyard by Marriott, Kingston Jamaica would also have its specific Emergency Response Plan for its operational phase. NEPA in the terms and conditions of the Environmental Permit issued for this development requires that an Emergency Response Plan be prepared prior to the start of construction. This Emergency Response Plan will include:

- The Incident Command System
- Communication Procedure - Internal and External Notification
- Personnel Safety
- Evacuation Procedure
- Emergency Equipment List
- Staff Training
- Vulnerability Assessment
- Spills Action Plan
- Fire Action Plan
- Earthquake Action Plan
- Hurricane Action Plan

➤ Emergency Contact Telephone Numbers for Staff

A Spill prevention and control plan already exists and will also in place to manage various types of spills. This is outlined below.

General Recommendations:

- ✓ If possible manipulate materials indoors in a confined space or in a location away from storm inlets.
- ✓ All containers should be identified appropriately so that the content is readily identifiable.
- ✓ Flatten the storage area to control any leaks or spills that occur.
- ✓ The storage area should be covered with a permanent structure, to prevent rain water from coming into contact with the materials stored therein.
- ✓ Check containers for leaks or spills, change any container that leaks, is corroded or damaged in any way by another one in good condition. Pick up any spills and dispose of them properly.
- ✓ Store, and transfer liquids so that if the container breaks or the liquid spills, it is not discharged into the storm water system.
- ✓ Place trays or absorbent material under shelves containing containers that may leak. Any spills should be collected and properly disposed.
- ✓ Transport only the minimum material to be used for daily activities.
- ✓ If the material storage area is paved, it must be swept and clean weekly.
- ✓ Place spill control elements to collect the fluids before they leave the storage area. This will collect any spills.

Spill Clean-up Procedure:

Small non-hazardous spills

- ✓ Use a damp cloth or absorbent material to clean up any spilled liquid.
- ✓ Use brooms and shovels to remove dry materials.
- ✓ If water is used, it must be collected later and disposed properly. The wash water cannot be flushed down the storm water system.
- ✓ Dispose of any waste materials properly.
- ✓ Clean or discard properly any equipment used to clean spills.

Large non-hazardous spills

- ✓ Use absorbent materials to clean spills.
- ✓ Use brooms and shovels to remove dry materials.
- ✓ If water is used, it must be collected later and disposed properly. The wash water cannot be flushed down the storm water system.
- ✓ Dispose of any waste materials properly.

- ✓ Clean or discard properly any equipment used to clean spills.

In case of large spills of hazardous materials call the fire department or hire a company specializing in hazardous materials.

Spill of chemical materials clean-up must be performed using chemical absorbents, gel or foam. After removing the absorbent material it should be disposed of properly.

If the spill is a hazardous material, clean the area with an absorbent material and dispose of properly.

4.2.9 OCCUPATIONAL HEALTH AND SAFETY

Section 4.1.4 above outlined occupation health and safety standards considered within Caribe Hospitality's Environmental Social and Health Management System to be employed. These standards will be followed during both construction and operational phases and includes provisions for worker health and safety.

The occupational health and safety manual and all the activities related to safety and health of the company aims to achieve a safe environment in all projects and facilities of the company to its direct labour, indirect labour, customers and visitors. The manual establishes the minimum requirements and standards of occupational health and safety that people who work directly or indirectly for the developer should meet.

No medical facility will be on-site, however, a first aid kit will be available on site for minor injuries and provisions will be in place to transport more serious injuries to close by clinics and hospitals.

4.2.10 LABOUR AND WORKING CONDITIONS

During operation, an approximate 65 persons is expected to be employed to the hotel.

Working conditions such as wage rates and working hours (including lunch and rest breaks) will be defined and in line with local labour laws as outlined by the Joint Industrial Council (JIC0 as well as Marriott's Human Resource Policy which comply with core international labour standards on workers' rights, forced labour, child labour, and minimum working age, etc. The policy would also outline compensation for workers for working overtime; and the provision of additional benefits (e.g., meals, access to medical care, on-site housing, etc.

Drinking water will be available on site and a grievance mechanism through which workers can voice concerns is available. Marriott's Human Resource practices include not only a competitive pay package, but also a good work life. The company gives equal importance to non-monetary factors such as: work-life balance, good leadership, better growth opportunities, a friendly work environment and training. Marriott's International Human Right's Policy is outlined in Appendix VII.

4.2.11 SOCIOECONOMIC IMPACT

Security

During operation, Courtyard by Marriott will decide on the security. It is likely that a reputable private security company will be put in charge of security in keeping with the culture of area. This is to ensure that staff and guests on the compound are safe.

Community Engagement

Caribe Hospitality's Environment Social and Health Management System includes procedures for a grievance mechanism to be put in place so that members of the surrounding community can voice any concerns if any challenges arise.

During operation community engagement would be guided by Marriott's' Corporate Social Responsibility programme as outlined in Section 4.1.6.

Marriott International is a founding member of the International Business Leaders Forum's (IBLF) Tourism Partnership, and it participates in the IBLF/UN World Tourism Organization task force on developing human rights principles for the hotel industry (Marriott International, 2007).

Their philosophy is not only to people but to critical issues facing the environment which ignited the formation of their companywide Environmentally Conscious Hospitality Operations (ECHO) programme.

4.2.12 ASSOCIATED IMPACTS

Global tourism induced climate change impacts are principally related to transportation to and from the tourist destinations. Additional impacts are also associated with energy used in construction and operation of hotels and resort areas.

Climate change impacts from energy used in construction and operation of the hotels is not expected to be great. Caribe Hospitality, as outlined in Section 4.2.4 has plans to implement several energy conservation measures to reduce overall energy consumption. Caribe Hospitality can offset global emissions through the conservation programmes on site.

4.2.13 OTHER ISSUES

No negative change is expected on the project site with respect to impacts on geological resources and biological resources. Visual resources will be improved from an empty lot with largely grass and gravel ground cover to a uniquely constructed hotel with appropriate landscape features.

4.3 OTHER ENVIRONMENTAL AND SOCIAL RISKS

No structures were on the project site prior to land acquisition to cause any environmental and social issues.

The Jamaica National Building Codes take into consideration building requirements to protect against potential damage from natural hazards such as: tropical cyclones and earthquakes. The building codes have been taken into consideration. The client has met these requirements and received building approval from the KSAC.

A point to note is that the recently passed Building Codes for Jamaica, included the adoption of the International Building Codes (IBC) as the base document, and the development an appropriate ‘application documents’. These application documents refer to the incorporation of special construction practices peculiar to Jamaica; specific environmental and climatic conditions for Jamaica; the incorporation of local hazards; and the inclusion of energy efficiency features. These building codes have incorporated the use of the California code for seismic activity since similar earthquake risks are likely for Jamaica.

Caribe Hospitality of Jamaica Ltd. has not only sought to meet local building codes but also sought to meet the Florida Building Codes, specifically the Miami-Dade wind loads, since winds speeds experienced in Florida are similar to Caribbean conditions.

The developer has hired competent professionals to provide input to the project design and execution. Table 4.1 below illustrates.

TABLE 4.1: PROFESSIONALS ON PROJECT

Role	Firm	Position	Name
Owner Group			
Project Management	Caribe Hospitality	Project Manager	Federico Aguilar
Project Management	Caribe Hospitality	Development Manager	Mariano Bonilla
Project Direction	Caribe Hospitality	Director	Daniel Campos
Project Management	Jamaica Property	Project Manager	Sam Cooper
Design Consultants			
Architecture	Zurcher Arquitectos S.A.	Partner	Adrian Saballos
Architecture	Zurcher Arquitectos S.A.	Architect	Jimmy Morales
Interior Architecture	Zurcher Arquitectos S.A.	Architect	Andrea Sotomayor
Structural Engineering	EEB Ingeniería S.A.	Principal	Edwin Espinoza
Structural Engineering	EEB Ingeniería S.A.	Structural Engineer	Cristiana Echandi

Role	Firm	Position	Name
Electrical Engineering	Ingenya Consultores S.A.	Electric Engineer	Christian Paganella
Mechanical Engineering	Termoire S.A.	Mechanic Engineer	Manrique Alonso
Commissioning Agent	Termoire S.A.	Mechanic Engineer	Orlin Velinov
Interior Design	Caruso Design Group, LLC	Interior Designer	Dina Caruso
Local Consultants			
Architecture	Michael Lake & Associates Ltd.	Principal	Michael Lake
Structural Engineering	Hue Lyew Chin Engineering Ltd.	Partner	David Goldson
MEP Engineering	Omni Services Co. Ltd.	Partner	Danny Hibbert
MEP Engineering	Omni Services Co. Ltd.	Partner	Raymond Richardson
Local Project Managers			
Project Management	Neustone Ltd.		
Project Management	Neustone Ltd.		
Project Management	Neustone Ltd.		
Project Management	Neustone Ltd.		

4.4 CUMULATIVE IMPACTS

Traffic and air quality would be the most significant negative effects of this project during construction. During operation solid waste and sewage would have the most significant potential negative impacts. These potential impacts as previously discussed in their respective sections will have mitigation measures to reduce or eliminate the potential negative impacts.

Based on the assessment, the overall impact is positive since the project brings to the New Kingston area an increase in business room count to meet the business demand. Furthermore, the hotel would act as a leader in Jamaica being one of the first hotels to be constructed to meet the international LEED certification standards.

5.0 ENVIRONMENTAL AND SOCIAL MITIGATION AND MANAGEMENT

5.1 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

Section 5 outlines appropriate mitigation and management measures impacts and risks described in Section 4 for both the construction and operations phase.

5.1.1 MITIGATION MEASURES FOR POTENTIAL ENVIRONMENTAL IMPACTS IDENTIFIED

Water Quality

Potable water quality during construction and operation would be supplied by the National Water Commission which is the approved public water supply. Although water quality from this source would already meet local water quality standards and during operation bottled water will be an option to guests for drinking water, standards can be monitored to ensure that it meets international standards.

Water quality of the grey water recycled in the Brac system during construction and operation would be monitored as a mitigation measure to ensure that it meets required standards for reuse for its specific purposes.

These monitoring steps would ensure that existing treatment systems are effective. Monitoring also highlights areas errors within the system.

In addition to monitoring, instructions should be given to guests with the necessary information about areas where recycled water is being utilised.

Although there are no natural drainage features on site, the developer has taken steps to prevent contamination of storm water which would run from the site. The storm water pollution prevention plan outlines the following best management practices that would be employed during construction to prevent contaminants runoff.

- Prevent rainfall runoff to enter waste area by means of a ditch or berm
- Avoid rainfall to enter in contact with wastes
- Cover piled wastes with a polyethylene membrane or similar
- Cover waste area with a temporary roof, if possible
- Cover waste containers to avoid filling up with rainfall

Inspect waste storage area to identify fluid leaks.

Waste Management

NEPA stipulated to the developers, in their Environmental Permit, the submission of a Waste Management Plan to guide construction and operation. In addition to this plan, the developers also have a Storm Water

Pollution Prevention Plan (SWPPP) which also incorporates waste management measures to guide construction.

The SWPPP that will guide construction process also outlines mitigation measures to prevent material and waste from being removed from the site. The developer will put plans in place for the proper storage of construction materials, especially those considered hazardous or toxic. Paints, solvents, fuel, oils and other hazardous materials would be kept indoors in an enclosed location to avoid secondary contamination by mixing with surface runoff.

The developer has noted that some materials such as paints, solvents and fuels require the use of a separate container such as bins or trays to avoid soil contamination. In addition, specific areas for fuel loading, paint and mortar mixing would be defined for better control of these processes.

Stockpiling material of sand and gravel would be protected to avoid contamination of storm waters. Contamination would be prevented by:

- Minimizing stock pile inventory on site.
- Maintaining a careful control of inventory, daily updated.
- Containing and covering stockpiled material to prevent storm water contamination
- Covers will always be in place when material is not in use.
- If stockpile is too large to be covered, means to prevent erosion and sediment retention would be taken, by use of berms, ditches or dikes around the stockpiles.

Pre-mixed concrete suppliers would be encouraged to wash their equipment in their own facilities. If this is not possible, then a special concrete washing area within the site would need to be established. This area would need to be a pit 5m wide x 5m long x 3m deep with waterproof walls and bottom with 0.25mm thick plastic membrane (Figure 5.1).

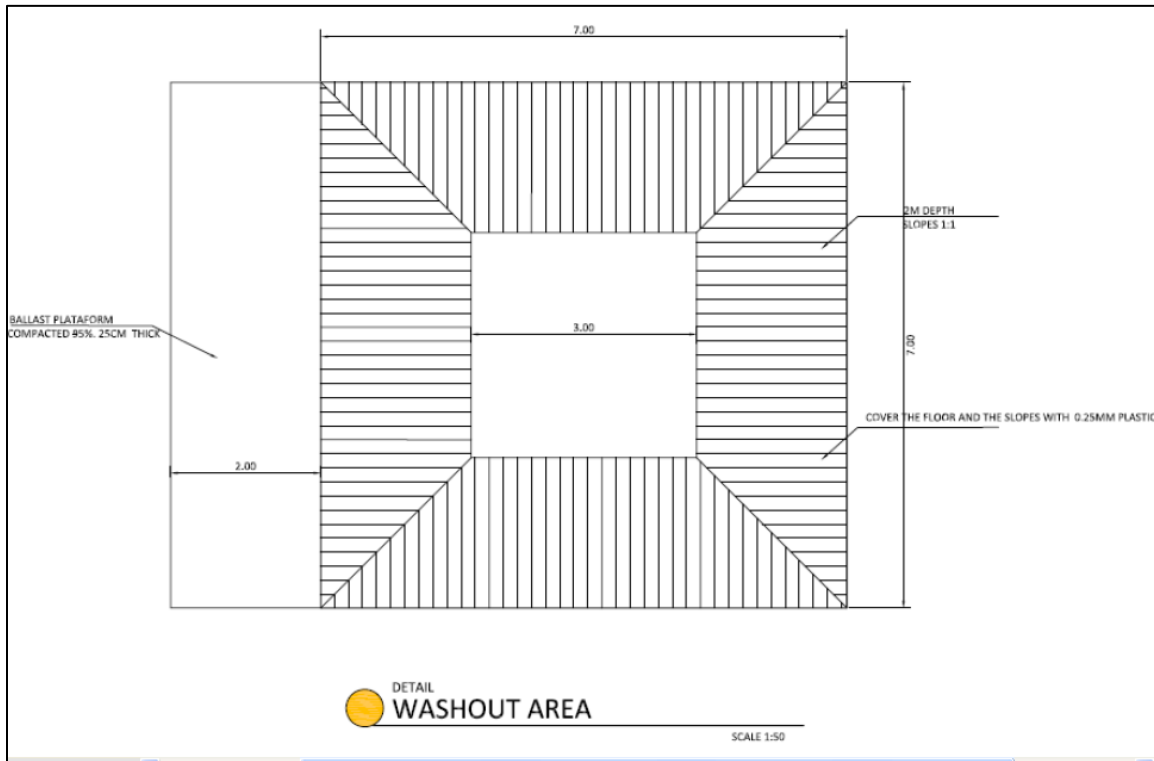


FIGURE 5.1: CONCRETE TRUCKS/ PUMPS WASHOUT PIT

This containment pit would be cleaned and waterproofing replaced every time the pit is filled up. The area would be properly identified, fenced and signalized. Concrete washing waste would not be discharged into the storm water drains, inlets, catch pits, roadways, vegetated areas or nearby creeks. The waste material would be treated properly. The preferred method consists of letting the water evaporate, and recycle the hardened concrete. The developer notes that water resulting from the concrete trucks washing is highly contaminant.

Mitigation measures are also put in place to prevent potential pollution as a result of fuelling of equipment. These measures outlined below are included as part of the Storm Water Pollution Prevention Plan (SWPPP) developed for the project.

FUELLING OF EQUIPMENT

If equipment will be fuelled on site, the following conditions would be met:

- Designate and mark a fuelling area. This area would be paved with concrete or asphalt, with a slope of 2% to 4% to avoid ponding, and would be protected with a perimeter curb to avoid rainfall runoff to pass through the area.
- Tarp or roof would be used to cover the dispensing area to prevent rainfall from making contact with fuels.
- The fuelling area clean would be kept clean using dry cleaning methods, such as sweeping or absorption rags to recover leaks. The area would not be washed with water.
- Automatic shut-off valves would be used in fuel dispensers.

In case of a leak:

- A Leakage Prevention and Containment Plan would be created implemented, and kept updated
 - Absorbent material (such as sand or wood particles) would be kept close to the fuelling areas, with easy access in case of a leak.
 - Contaminated absorbent material would be properly disposed.
 - Leaks would be reported immediately.
-
-

Mitigation guidelines with respect to the repair and maintenance of vehicles and the washing of equipment and vehicles are also outlined.

REPAIR AND MAINTENANCE OF VEHICLES

No oil changes will be allowed on site.

If a truck or machinery unit breaks down or needs oil changes and/or other type of maintenance it would be transported off site to a mechanical shop for repairs.

If a particular type of equipment cannot be transported off site for repairs or maintenance, the following measures would be put in place to be observed:

- The maintenance or repairs must be done in the Designated Fuelling Area.
- Maintain the equipment and machinery clean, avoiding excess oil and grease build-ups.
- Perform maintenance and repairs indoors when possible.
- Maintain fluid containers in an enclosed location and minimize contact with storm water.
- Keep the fuelling area clean, using dry cleaning methods, such as sweeping or absorption rags to recover leaks. Do not wash the area with water.
- If repairs or maintenance cannot be done in the Designated Fuelling Area:
 - Cover the area to avoid rainfall exposure.
 - Build a curb, berm or ditch around the area to avoid surface runoff contamination.
 - Keep spare parts and damaged parts indoors.
- Recover all waste fluids in bins or trays to avoid leaks. Dispose these properly.
- Do not discharge fluids from equipment or vehicles onto sewage drains.
- Store used batteries into a secondary container to avoid acid spills. Dispose these properly.
- Dispose oil and fuel filters properly.
- If a machinery piece is to be stored outdoors because of its size, remove all fluids, grease and oil to avoid accidental leaks.

Parked vehicles and machinery must be constantly inspected to identify oil or other fluid leaks. Clean unused part of vehicles or equipment.

VEHICLE AND EQUIPMENT WASHING

Water product of washing equipment and vehicles can be absorbed by the ground and contaminate it with hydrocarbons, oils, greases, phosphates, heavy metals and suspended solids.

Contamination Prevention:

- If possible, wash and clean equipment in a designated area, located outside the construction site.
- When cleaning is necessary within the construction site, a paved area must be assigned for this task, where water from the process can be collected. This area must be protected by a perimeter curb to avoid surface runoff to contaminate from the materials present in the area.
- No oil or filter changes or refuelling must be done in this area.

Protocol for the washing of vehicles and equipment:

- Use biodegradable phosphate free detergents.
- Clearly mark and install signage for the washing area.
- Place waste containers in the washing area.

Ambient Air Quality

Mitigation measures to control dust during construction are included as part of the SWPPP. Dust control measures are largely mitigated through periodic irrigation, at least 3 times a day during the necessary periods during dry season, until areas have been permanently stabilised with vegetation, or by construction of buildings and/ or roads/ parking.

The placing of a temporary gravel layer around the building site to cover exposed soil during the building construction period helps to reduce airborne dust during the dry season in addition to several other benefits.

Noise Quality

The clearing, excavation, drilling, construction and vehicle activities associated with the construction of the bulk cement handling facility all have the potential to result in significant levels of noise and vibration. There are nearby businesses and land owners who may experience a noise problem. This element aims to ensure that the neighbours are not unduly affected by noise generating activities. It is expected that hours of operation will limit the impacts of noise and vibration. To minimize the noise and vibration impact during construction and ensure compliance with any Permits granted, the following mitigation measures should be adhered to:

1. Advise neighbouring properties at least 48 hours in advance of planned noisy activities including: excavation and drilling.

2. Confine construction activities within normal operating hours (i.e. 7:00 Am - 6:00 Pm Monday to Friday and 8:00 am - 6:00 pm on Saturdays) as stipulated in the Environmental Permit issued by NEPA. Furthermore, no work should be done on Sundays and Public Holidays and any work required outside of this period will require permission from the Authority.
3. Contractor to monitor vehicle and equipment noise level and ensure that regular servicing is done to reduce noise levels to the nearby businesses and hotels. Noise levels will comply with that approved by NEPA based on the baseline studies conducted for the project site.

Earth Movements

To mitigate against top soil clean-up and minor earth movements that may occur on the project site. Important conditions that would be considered include:

- The construction and maintenance of site existing fence to prevent pedestrians from entering the construction site.
- Most of the site is gravelled. Any top soil that can be rescued will be stocked piled separately and will be covered with plastic for protection during the rainy season.
- Silt fences will be used along the south boundary of the site to prevent sediments from being carried out of the site to the sidewalk.
- A fence will be built towards the northern part of the site which is not part of the hotel site, to avoid disturbances.

Natural Hazards and Climate Change

Section 4.1.1 indicated the potential for susceptibility to climate related hazards since Jamaica is located in the hurricane belt. As such high wind conditions and flooding due to poor storm water runoff are possible.

The project design plans include the construction of drainage wells to be placed along the car park and circulation driveway to drain within the site the storm waters, equally distributed, along the driveway, with a final drainage well at the lower end of the driveway. This is in compliance with NEPA's permit, which requires the project to dispose of its storm waters within the site. To accomplish this, a storm water detention underground tank will be built to allow for the retention of peaks in storm water and prevent overflows into the road (Figure 5.2). The storm water detention tank is designed to accommodate a 7 minute high intensity event. This is guided by climatic changes which have predicted the occurrence of more short duration, high intensity events. The depth of the retention tank is also guided by the results of the soil permeability tests which reveal that the soil is impermeable beyond 13.7 metres.

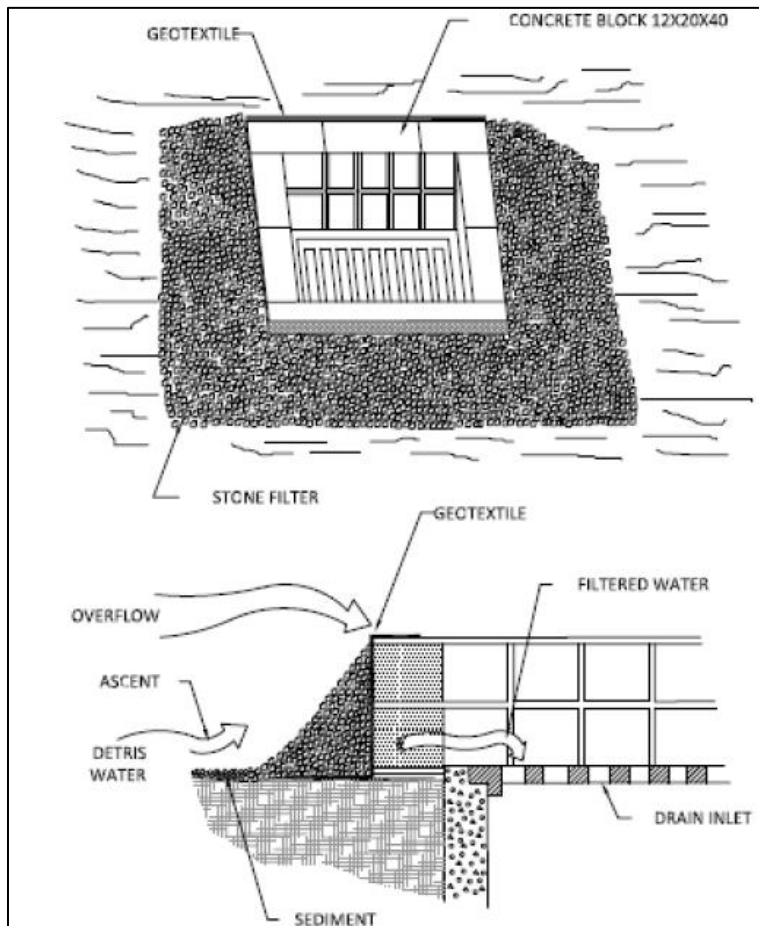


FIGURE 5.2: STORM DRAIN INLET PROTECTION CATCH PITS

This design proposed by the developers is a positive mitigation measure to control storm water run-off and reduce the potential for flooding.

The hotel design both follow the Jamaica National Building Codes (2011) and the Miami-Dade wind loads as indicated above to withstand earthquakes and high winds.

5.1.2 SCHEDULE FOR MITIGATION MEASURES

The project is divided into three phases: planning and design; construction and operations start; and operation phase. Mitigation measures have been incorporated in each phase for various environmental aspects although most measures can be found within the construction phases (See Table 5.1).

TABLE 5.1: SCHEDULE FOR MITIGATION ACTIVITIES

Items	Schedule of Mitigation Activities	Responsible Party	PROJECT PHASES				
			Project Design Phase	Construction Phase I (1 month)	Construction Phase II (18 months)	Operation Phase	Associated Costs
	Phase I - Site Clean-up, grading and stormwater infrastructure						
	Phase II - Building Construction Phase						
1	Construct diversion Berm in North Boundary of Site at start of Phase I.	General Contractor/ Earthworks Subcontractor					
2	Dust control - Periodic irrigation at least 3 times daily during construction in the dry season	General Contractor/ Earthworks Subcontractor					
3	Temporary gravel layer	General Contractor/ Earthworks Subcontractor					
4	Installation of catch pits protection at the end of Phase I and maintained during Phase II	Earthworks Subcontractor (implementation)/ General Contractor (Maintenance)					
5	Install silt fence along southern boundary of site and the beginning of Phase I and maintained in Phase II	Earthworks Subcontractor (implementation)/ General Contractor (Maintenance)					
6	Sediment traps would be installed during Phase I and maintained during Phase II	Earthworks Subcontractor (implementation)/ General Contractor (Maintenance)					

Items	Schedule of Mitigation Activities	Responsible Party	PROJECT PHASES				
			Project Design Phase	Construction Phase I (1 month)	Construction Phase II (18 months)	Operation Phase	Associated Costs
7	Establish stabilised trucks and machinery exits prior to the start of Phase I and maintain during Phase II	Earthworks Subcontractor (implementation and early maintenance)/ General Contractor (Maintenance)					
8	Waste management measures implemented at the start of project	Contractor EHS Officer					
9	Sanitary and septic waste provided	Contractor EHS Officer					
10	Prevention of runoff contaminants put in place at start of project	Contractor EHS Officer					
11	Hazardous chemical and waste management put in place at start of project	Construction - Contractor EHS Officer Operation – Hotel Management					
12	Definition of proper construction storage areas at start of project	Contractor EHS Officer					
13	Mitigation measure to prevent contamination from stockpiling from start of project	Contractor EHS Officer					
13	Designation of washout areas	Contractor EHS Officer					
14	Mitigation measure to prevent contamination from fuelling equipment from start of project	Contractor EHS Officer					
15	Repair and maintenance of vehicles	Contractor EHS Officer					
16	Vehicle and equipment washing	Contractor EHS Officer					

Items	Schedule of Mitigation Activities	Responsible Party	PROJECT PHASES				
			Project Design Phase	Construction Phase I (1 month)	Construction Phase II (18 months)	Operation Phase	Associated Costs
17	Construct storm water detention tank	Construction - contractor Maintenance Operation - Hotel Management					
18	Install Porous pavement in parking spaces	Construction - contractor					
19	Install permanent vegetation - landscaping end of Phase II	Post Construction - Landscape Manager Operation Maintenance - Hotel Management					
20	Cleaning of storm water detention tank at end of Phase II	Construction - General Contractor Maintenance Operation Maintenance – Hotel Management					
21	Inspection during construction- at least once every two weeks and within 24hrs after rainfall events >0.5 inches	Construction - SWPPP Official Inspector					

5.1.3 EVALUATION OF PROPOSED PREVENTATIVE / MITIGATION MEASURES

The preventative and mitigation measures have been clearly articulated and are technically sound. Based on international experience, these measures have been proven financially feasible within the project context.

5.1.4 RECOMMENDED MONITORING PROTOCOLS

Prior to proceeding with the project the developer should develop a detailed Environmental Management Plan to guide construction and operation activities. This EMP as stipulated by NEPA and should outline a schedule for monitoring the following areas to ensure that it meets the national standards during construction and operation:

- ✚ **Ambient Air quality** during construction - To minimize and control dust and exhaust emissions to reduce the impacts of construction on air quality.
- ✚ **Noise and vibration** during construction - To minimize the noise and vibration impact during construction and ensure compliance with any Permits granted.
- ✚ **Water Quality for the grey water recycled** in the Brac system during operation – To ensure recycled water meets required standards.
- ✚ **Vehicle Transport** during construction– To minimise associated environmental impacts with the haulage of materials for construction.
- ✚ **Vehicle and Equipment Servicing, Repairs and Wash Down** during construction- To ensure that the use and maintenance of machinery on-site does not result in environmental pollution.
- ✚ **Hazardous Materials Storage and Handling** during construction - To ensure that any dangerous goods used on-site are appropriately stored and handled to minimize the potential for environmental pollution.
- ✚ **Solid Waste Management** during construction and operation - To ensure that solid waste generated at the sites during the construction phase are disposed of at the nearest municipal dumpsite.
- ✚ **Sewage Treatment** during construction - To ensure a clean and hygienic construction site.
- ✚ **Drainage and Surface runoff** during construction and operation - Ensure that surface runoff is managed in accordance with current best practice environmental management practices, to prevent sediment-laden water from entering any drainage system or coastal water.
- ✚ **Traffic Management** during construction - To prevent build-up of truck traffic in the project area.

- ✚ **Water Conservation** during operation – To ensure that water conservation measures are implemented and are functioning effectively
- ✚ **Energy Conservation** during operation – To ensure that water conservation measures are implemented and are functioning effectively

Potable Water Quality will not be monitored since water will be supplied from the National Water Commission which is the approved public water supply. Furthermore, during operations hotel management will also provide bottled water as an option to guests for drinking water.

5.1.5 INCORPORATION OF SUSTAINABLE ALTERNATIVES

Measures to improve the overall environmental and social performance of the project have been incorporated within the project design. Water and energy conservation are given close attention due to the need to meet LEED certification.

With respect to water conservation, Caribe Hospitality of Jamaica Ltd. has plans in place to install water conservation measures such as the use of low-flow fittings for toilets, faucets, showers, and laundry and kitchen equipment in preparation for the operation phase. In addition, the installation of the Brac system for grey water recycling already discussed in Sections 1.3.3 and 4.2.1 is also expected to conserve on water supply. These are positive steps taken by the developer to conserve of water supply during operation.

Caribe Hospitality of Jamaica Ltd. plans to implement energy conservation measures to meet LEED silver certification requirements. A range of measures are to be implemented and these have been detailed in Section 4.2.4 above.

5.1.6 IMPLEMENTATION SCHEDULE FOR MONITORING ENVIRONMENTAL AND SOCIAL IMPACTS

Section 5.1.4 above outlines environmental and social aspects recommended for monitoring. These aspects are indicators to measure outcomes in risk mitigation from the implementation of environmental and social risk management actions. Table 5.2 below outlines the schedule for monitoring these indicators as guided by the terms and conditions of the Environmental Permit issued by NEPA. Indicative costings for these monitoring activities are also presented. This would form part of the Environmental and Social Management Plan.

TABLE 5.2: IMPLEMENTATION SCHEDULE FOR MONITORING ENVIRONMENTAL AND SOCIAL IMPACTS

Items	Schedule for Monitoring Activities	Construction Phase (Months 1-3)	Construction Phase (Months 4-18)	Operation Phase
1	Air Quality Monitoring	Monthly	Quarterly	
2	Monitoring of Recycled Grey water quality within Brac System			Six monthly
3	Noise Monitoring	Monthly	Quarterly	
4	Site Inspections and Assessments (general housekeeping, waste management, spills, drainage, pollution, transport and vehicle maintenance, landscape, health and safety etc.)	Monthly	Quarterly	
5	Water Conservation			Six monthly
6	Energy Conservation			Six monthly
Associated Costs²		\$1,350/month	\$1,350/quarter	\$1,350/six months

Traffic will be monitored according to the guidelines set out in the Traffic Management Plan. This plan will be developed in accordance with the guidelines set out by NEPA to guide the construction and operational phases of the development. The Traffic Management Plan would be prepared based on a traffic assessment of the immediate location. The traffic assessments would include traffic volumes and patterns, pedestrians, parking capacity, and road capacity, among others. Based on the results of the assessment, recommendations relating to the type of junction needed, storage requirements, parking, pedestrian crossing and public passenger vehicle facilities etc. would be made to resolve potential traffic issues during construction and operation.

5.1.7 REVIEW OF ENVIRONMENTAL AND SOCIAL MANAGEMENT SYSTEM

Caribe Hospitality of Jamaica Ltd. developed and Environment Social and Health Management System. This management system is driven by a sustainability policy.

² Associated costs for monitoring activities are estimates which are indicative of likely costs.

CARIBE HOSPITALITY'S ENVIRONMENT SOCIAL AND HEALTH MANAGEMENT SYSTEM





SUSTAINABILITY POLICY

Caribe Hospitality is committed to the development and management of hotel assets that operate in a profitable manner, with a strong commitment to sustainability criteria and ethical values and social processes involved in its business and in their areas of influence

This management system outlines the environmental and social aspects and impacts. Table 5.3 below outlines the environmental aspects considered under the management system and their level of risk and priority for action in terms of low medium and high during the planning and design phase; the construction phase; and the operation phase.

TABLE 5.3: ENVIRONMENTAL ASPECTS CONSIDERED IN THE PROJECT PHASES

Possible Impacts	Planning/ Design	Construction/ Commissioning	Operation
Flora, Fauna and ecosystems			
Solid waste generation			
Wastewater generation			
Energy Consumption			
Emissions to the air			
Noise Generation			
Earth movement			
Groundwater affectation			
Access roads affectation			
Stormwater increase/ floodings			
Community relations affectation			
Possible resettlement			
Affectation of human health and safety (employees / guests)			
Affectation of cultural values			
Pressure on public services such as water and energy			

Possible Impacts	Planning/ Design	Construction/ Commissioning	Operation
Emissions of greenhouse gases			
Leaks / spills of toxic or hazardous			
LEGEND			
	The impact does not occur, or occurs so mild (momentary consequences, local, low magnitude and / or easily corrected)		
	The impact significance is presented with mean (temporal consequences of moderate magnitude and / or require specific management programs for the good environmental performance of the activity)		
	The impact does not occur significantly in the stage, but the activities in this stage do have significant influence on the respective topic. This colour is specifically applied to the case of the design and planning stage. In it, the social and environmental impacts of the activities performed in it are minimal, but the decisions made at this stage have huge implications in many of the impacts that the activity actually generated in the later stages.		
	The potential impact has high significance, can occur in a prolonged way with high impact. Specific management programs for care are required.		

Caribe Hospitality's Environment Social and Health Management System

The management system defines a specific procedure for the identification and evaluation of impacts in each project, and in each stage.

Caribe Hospitality is committed to comply with local regulations of each country in which it conducts its business activities and also with the requirements acquired with the IDB. The previous, for all areas covered which are of interest for the commercial nature of its business, as was described above.

Accordingly, in each of the projects developed, Caribe Hospitality takes into account the necessary measures to ensure compliance, so as to avoid potential complaints against them or against their contractors or subcontractors, as well as the financial institution involved.

In addition, to ensure legal certainty of its performances, keeps an update of the regulations that apply to projects from the early stage of design to operation. That record is updated quarterly and proceeds accordingly, depending on the settings that are identified.

Caribe Hospitality is currently revising and updating their Environmental Social and Health Management System. This revision version 3.0 will be completed prior to the beginning of the construction activities since

it contains significant guidelines for construction and operation. The following areas are included in Caribe Hospitality's Environmental Social and health Management System:

1. Sustainability Policies
2. Description of Activities (Planning and design, Construction and Start Up, and Operation)
3. Identification of Social and Environmental Aspects and Impacts
4. Compliance Process
5. Objectives and Indicators
6. Programmes, Plans and Procedures
7. Formation, Awareness and Professional Competence
8. Audits and Inspections
9. Documentation and Report
10. Communications
11. Structure and Responsibilities

Several procedures are detailed in the annexes of this document. These include:

- 📄 Environmental Conscious Hospitality Operations Manual (Marriott)
- 📄 Environmental Management Plan
- 📄 Permits
- 📄 Capacitating Procedure
- 📄 Contract Control Procedures
- 📄 Site Selection Procedure
- 📄 LEED Scorecard. Implementation Plan for LEED Commitments for the Operational Stage
- 📄 Owner Project Requirements
- 📄 Registry of lessons Learnt per Project
- 📄 Communal Relations Procedure
- 📄 Management Procedure for Protection Against Fire
- 📄 Storm Water Protection and Prevention Plan
- 📄 Occupational Safety Manual
- 📄 Health and Safety Project General Plan
- 📄 Environmental Health and Occupational Safety Monitoring Procedure at the Construction
- 📄 Environmental Health and Occupational Safety Risk Identification “walk”
- 📄 Marriott Template for the Development of an Emergency Attention Plan for Hotels Chains

Section 4.1.4 and 4.2.9 previously discussed aspects considered under the Occupational Health and Safety Manual that exists and is also part of this Environment Social and Health Management System. Section 4.2.10 outlines the Marriott International Humans Rights Policy embraced by the chain of hotels.

The Spills Prevention Plan established by the developer is outlined in the SWPPP. This was previously discussed in Section 4.2.8 above which will guide the construction and operational phases of the project.

5.1.8 RECOMMENDED MANAGEMENT ACTIONS

No deficiencies have been identified within the plans of the management system. The system contains all the relevant sub plans necessary to guide the project. In addition, the document has been used successfully in the Courtyard Airport San José Alajuela in Costa Rica.

Once the developer complies with the necessary procedures of the following, they would be able to meet both local and international standards.

- ✓ LEED Certification Criteria
- ✓ Terms and Conditions of Environmental Permit issued by NEPA and supporting plans to be developed to guide construction and operation:
 - Waste Management Plan
 - Emergency Response Plan
 - Evacuation Plan
 - Landscape Plan
 - Traffic Management Plan
 - Environmental Management Plan
- ✓ Terms and Conditions of Building Permit issued by KSAC
- ✓ Storm Water Pollution Prevention Plan
- ✓ Caribe Hospitality's Environment Social and Health management System and supporting documents for example:
 - Occupation Health and Safety Manual
 - Environmental Management Plan

5.1.9 ADEQUACY OF RESOURCES

Caribe Hospitality of Jamaica Ltd., with the help financial assistance of the IDB, has sufficient resources financial, equipment, personnel, and other resources to ensure effective implementation of the recommended environmental and social risk management plan.

Caribe Hospitality also has been involved in other international developments with a good track record with well trained and professional staff. Training of applicable workers involved with the construction and operations phase of the project is a part of the SWPPP which guides the construction phase and Marriott International's human resource best practices and Caribe Hospitality's Environment Social and Health Management System which will guide the operation phase.

5.1.10 ENVIRONMENTAL INITIATIVES

Environmental initiatives taken by Caribe Hospitality of Jamaica Ltd. largely lies with their intention to obtain Silver level LEED certification for the construction and operation of the hotel and the implementation of a Storm Water Pollution Prevention Plan (SWPPP) which will guide the construction process.

As discusses earlier in Section 5.1.5 and 4.2.4, LEED criteria will be met from the design and planning phase of the project and follow through to construction and operation. The SWPPP has provisions for inspection reports and a corrective action log to be completed (Figure 5.4).

Appendix F – Corrective Action Log				
Project Name: SWPPP Contact:				
Inspection Date	Inspector Name(s)	Description of BMP Deficiency	Corrective Action Needed (including planned date/responsible person)	Date Action Taken/Responsible person

FIGURE 5.3: SWPPP TEMPLATE FOR CORRECTIVE ACTION LOG

In addition to this Subcontractor Certification/ Agreements would be prepared and illustrated below in Figure 5.5 to ensure that subcontractors agree and follow through with following the stipulated guidelines during

construction. A training log and delegation of authority would be documented to keep track and ensure that qualified personnel are placed in the various positions (Figure 5.6 and 5.7).

SUBCONTRACTOR CERTIFICATION STORMWATER POLLUTION PREVENTION PLAN	
Project Number:	_____
Project Title:	_____
Operator(s):	_____
<p>As a subcontractor, you are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that you perform on-site. Any person or group who violates any condition of the SWPPP may be subject to substantial penalties or loss of contract. You are encouraged to advise each of your employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the office trailer.</p> <p>Each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement:</p> <p>I certify under the penalty of law that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the BMPs and practices described in the SWPPP.</p> <p>This certification is hereby signed in reference to the above named project:</p> <p>Company: _____</p> <p>Address: _____</p> <p>Telephone Number: _____</p> <p>Type of construction service to be provided: _____</p> <p>_____</p> <p>_____</p> <p>Signature: _____</p> <p>Title: _____</p> <p>Date: _____</p>	

FIGURE 5.4: SWPPP TEMPLATE FOR SUBCONTRACTOR CERTIFICATIONS/ AGREEMENTS

Stormwater Pollution Prevention Training Log

Project Name: _____

Project Location: _____

Instructor's Name(s): _____

Instructor's Title(s): _____

Course Location: _____ Date: _____

Course Length (hours): _____

Stormwater Training Topic: *(check as appropriate)*

Erosion Control BMPs Emergency Procedures

Sediment Control BMPs Good Housekeeping BMPs

Non-Stormwater BMPs

Specific Training Objective: _____

Attendee Roster: *(attach additional pages as necessary)*

No.	Name of Attendee	Company
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

FIGURE 5.5: SWPPP TEMPLATE FOR TRAINING LOG

Delegation of Authority

I, _____ (name), hereby designate the person or specifically described position below to be a duly authorized representative for the purpose of overseeing compliance with environmental requirements, including the Construction General Permit, at the _____ construction site. The designee is authorized to sign any reports, stormwater pollution prevention plans and all other documents required by the permit.

_____ (name of person or position)
_____ (company)
_____ (address)
_____ (city, state, zip)
_____ (phone)

By signing this authorization, I confirm that I meet the requirements to make such a designation as set forth in _____ (Reference State Permit), and that the designee above meets the definition of a “duly authorized representative” as set forth in _____ (Reference State Permit).

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gathered and evaluated the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: _____

Company: _____

Title: _____

Signature: _____

Date: _____

FIGURE 5.6: SWPPP TEMPLATE FOR DELEGATION OF AUTHORITY FORM

These mechanisms will ensure that proper mitigation measures are incorporated into the management of the hotel from project design through to construction and operation.

It is important to note that there are no past issues or liabilities with respect to the project site.

6.0 PUBLIC CONSULTATION

6.1 PUBLIC CONCERNS

The National Environment and Planning Agency (NEPA) usually requires that a public consultation be done whenever an Environmental Impact Assessment (EIA) is required for a project. NEPA has already issued a permit for the project to be conducted with terms and conditions to protect potential and immediate short term and long term challenges that might arise. No public consultation was completed since NEPA did not require an EIA.

Although there are no sensitive issues at hand, immediate neighbours namely: National Housing Trust, Emancipation Park and the Liguanea Club were consulted about the project.

A public presentation will be arranged and executed in October, 2012 to present the project to targeted stakeholders and the general public. The newspaper advertisement, attendance list, results and conclusion of this presentation will be included in Appendix VIII of this report.

The public will be informed of the plan to construct Courtyard by Marriott, Kingston Jamaica appropriately using methods such as: letter drop, signage, and newspaper articles. Dates would be provided to the public for the start of construction and for the start of operation. Measures will also be put in place during construction for grievances to be dealt with according to *Caribe Hospitality's Environmental Social and Health Management System*. The local liaison for this procedure will be the local Project Manager.

7.0 CONCLUSIONS & RECOMMENDATIONS

7.1 SUMMARY

The Environmental and Social Assessment revealed some critical aspects to be mitigated. These areas are:

- ✓ Waste Management
- ✓ Potable Water Quality
- ✓ Waste water Quality
- ✓ Ambient Air Quality
- ✓ Noise and Vibration
- ✓ Earth Movements
- ✓ Drainage
- ✓ Traffic Management
- ✓ Health and Safety
- ✓ Landscaping
- ✓ Energy Conservation
- ✓ Water Conservation

These aspects will be mitigated utilising the mitigation measures outlined in the Table 6.1 below. Impacts from these environmental and social aspects will be monitored as outlined in Section 5.1.6 above.

Critical Environmental and Social Aspects	Mitigation Measures
Waste Management	<p>General waste management protocol –</p> <ul style="list-style-type: none"> ▪ Designated site waste collection area and sufficient water proof container with lid ▪ Review integrity of waste containers weekly ▪ Maintenance - garbage containers covered at all times, sweep and clean waste storage areas regularly, soapy water from waste area collect in sanitary water collection system ▪ Ensure garbage collection process does not release fluids and lightweight material ▪ Avoid filling waste containers with wash water or liquid ▪ Ensure solid waste is sent to appropriate disposal site and hazardous materials are given special treatments. These should be stored in a designated area. <p>Sanitary cabins must be provided on the jobsite and sanitary main</p>

Critical Environmental and Social Aspects	Mitigation Measures
	<p>connected to the city sewer.</p> <p>Regular inspection of cabins for leaks and repair when damaged.</p>
Water Quality of Runoff	<p>Contaminants runoff prevention utilising a ditch/berm, covering of waste piles, waste storage areas, waste containers. Regular inspection.</p> <p>Designated storage areas for construction materials</p> <p>Proper covering of stockpiles</p> <p>Designated washout areas for pre-mixed concrete suppliers, vehicles and equipment as necessary</p>
Ambient Air Quality	<p>Dust control measures include periodic irrigation at least 3 times a day during the dry season until land is stabilised with vegetation.</p> <p>Temporary gravel layer to reduce airborne dust in the dry season</p>
Noise and Vibration	<p>Proper maintenance practices for vehicle and equipment maintenance</p>
Earth Movements	<p>Diversion berm along northern boundary of site</p> <p>Silt fence along southern boundary of site</p> <p>Temporary gravel layer to prevent soil erosion in the rainy season</p> <p>Construction of sediment traps</p> <p>Stabilised trucks and machinery exists</p>
Drainage	<p>Construction of catch pits protection</p> <p>Construction and maintenance of storm water detention tank</p> <p>Construction of porous pavement in parking spaces</p>
Traffic Management	<p>Guidelines in the Traffic Management Plan</p>
Health and Safety	<p>Spill prevention and control plan and procedures</p> <p>Guidelines in the Occupational health and Safety Manual</p> <p>Emergency Response Plan and Evacuation Plan</p>
Landscaping	<p>Installation of permanent vegetation following the Landscape Management Plan by landscaper.</p>

Critical Environmental and Social Aspects	Mitigation Measures
Energy Conservation	High performance chillers for HVAC Heat recovery wheel to pre-cool fresh air High performance windows and building envelope insulation to comply with ASHRAE 90.1 standards LED light fixtures in some locations Occupancy sensors in guestrooms to offset HVAC set point during non-occupied periods Solar heat collectors to pre-heat water
Water Conservation	To reduce pressure on the public water supply, a Brac System will be implemented to recycle waste water for reuse to flush toilets and for irrigation. Installation of low flow/ flush fixtures

The consultants have noted that very good plans have been put in place and are being developed for managing potential impacts to the various environmental and social aspects identified. Once the developers follow through with their plans, they will be able to meet and maintain local and international standards.

LIST OF REFERENCES

Environment Division. 2006. *Environment and Safeguards Compliance Policy*. Sustainable Development Department, Inter-American Development Bank, Washington D.C. No ENV-148.

Government of Jamaica. 1999. *Jamaica National Noise Standards*. National Environment and Planning Agency

Government of Jamaica. 1996. *Ambient Air Quality Standards Regulations for Jamaica*. National Environment and Planning Agency

Hoagland-Grey, H. et. al. 2011. *Environmental and Social Analysis: Small Hotels and Resorts (Category B)*. Inter-American Development Bank (IDB), Environmental Safeguards Unit, Technical Notes.

Jentech Consultants Limited. 2012. *Permeability Testing, Proposed Multi-Storey Development, New Kingston*.

Jentech Consultants Limited. 2011. *Soil Investigation Report, Jamaica Property Company Limited Multi-Storey Development*.

Marriott International Inc. 2011. *Human Rights Policy Statement*. Website: <http://www.marriott.com/Multimedia/PDF/Corporate/HumanRightsStatement.pdf> Retrieved: August 27, 2012.

Marriott International. 2007. *Social Responsibility & Community Engagement*. Website: www.marriott.com/socialresponsibility.com. Retrieved: August 14, 2012.

Oak Ridge National Laboratory. 2008. *Insulation Fact Sheet*. Website: http://www.ornl.gov/sci/roofs+walls/insulation/ins_05.html. Retrieved August 14, 2012.

Occupational Safety Health Administration. *OSHA Noise Exposure Standards*. Website: <http://www.uvcuring.com/faxinfo/noise/noise.htm>. Retrieved, August 20, 2012.

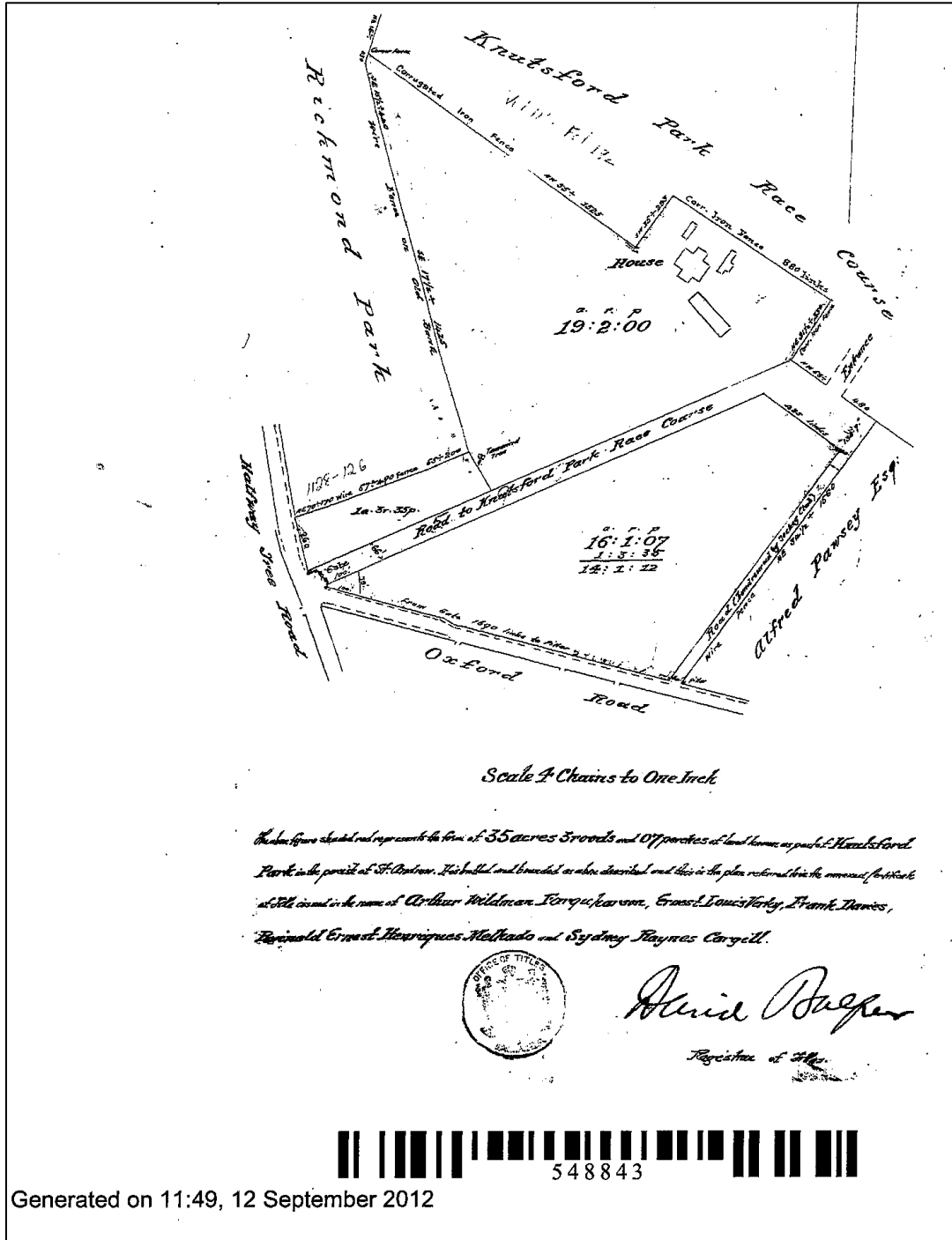
Sustainable Development Department. 2007. *Implementation Guidelines for the Environment and Safeguards Compliance Policy*. Inter-American Development Bank: Washington, D.C. p 42.

TradePress 1995-2012. *HVAC Efficiency: Chillers*. Website: <http://www.facilitiesnet.com/energyefficiency/article/Chillers-Performance-Challenges-and-Solutions--8262>. Retrieved: August 20, 2012.

United States Green Building Council (USGBC). 2012. *LEED*. Website: <https://new.usgbc.org/leed>. Retrieved: August 20, 2012.

World Health Organization. 1999. *Guidelines for Community Noise*. Website: <http://www.who.int/docstore/peh/noise/Comnoise-4.pdf>. Retrieved August 14, 2012.

APPENDIX I – Historical Land Use of Project Site and Situation

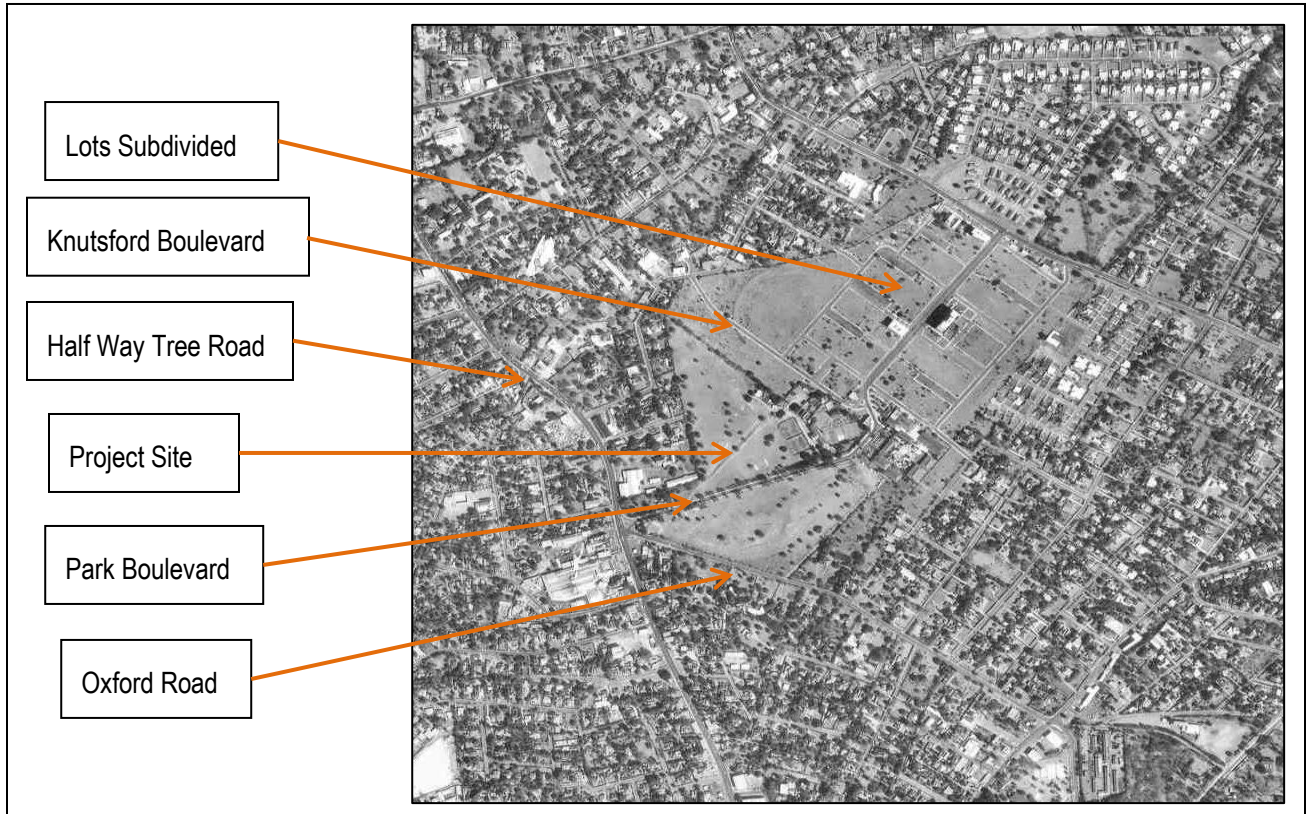


Original Title Diagram for Project Site - 1910 (Source: National Land Agency)



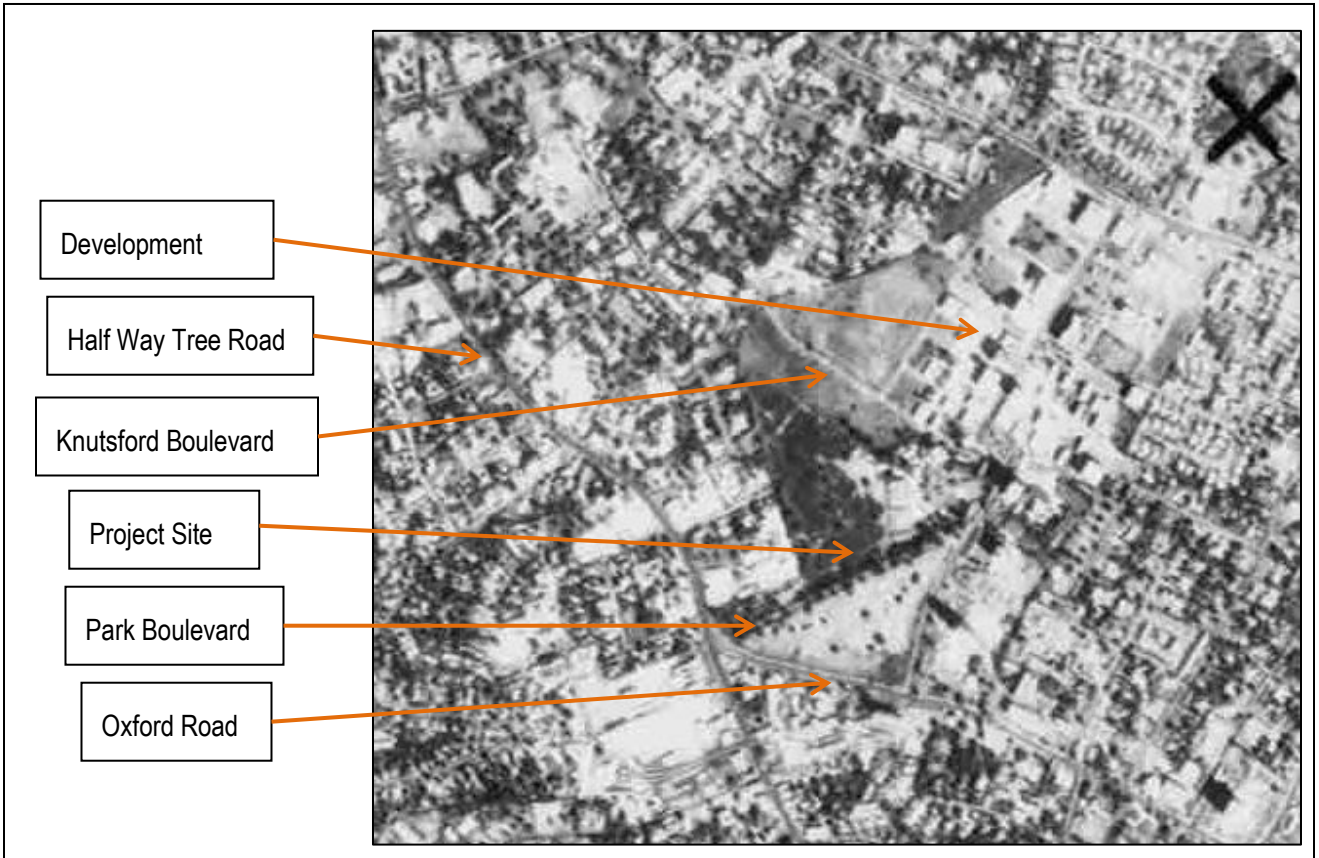
1: 50 000 Aerial Image of New Kingston – 1941 (Source: National Land Agency)

Notice the Knutsford Park Race Course and the area east of the project site which was likely to be stables. Notice the presence of Half Way Tree Road and Oxford Road and the absence of the National Housing Trust and Emancipation Park. Notice also that there is no development on the project site.



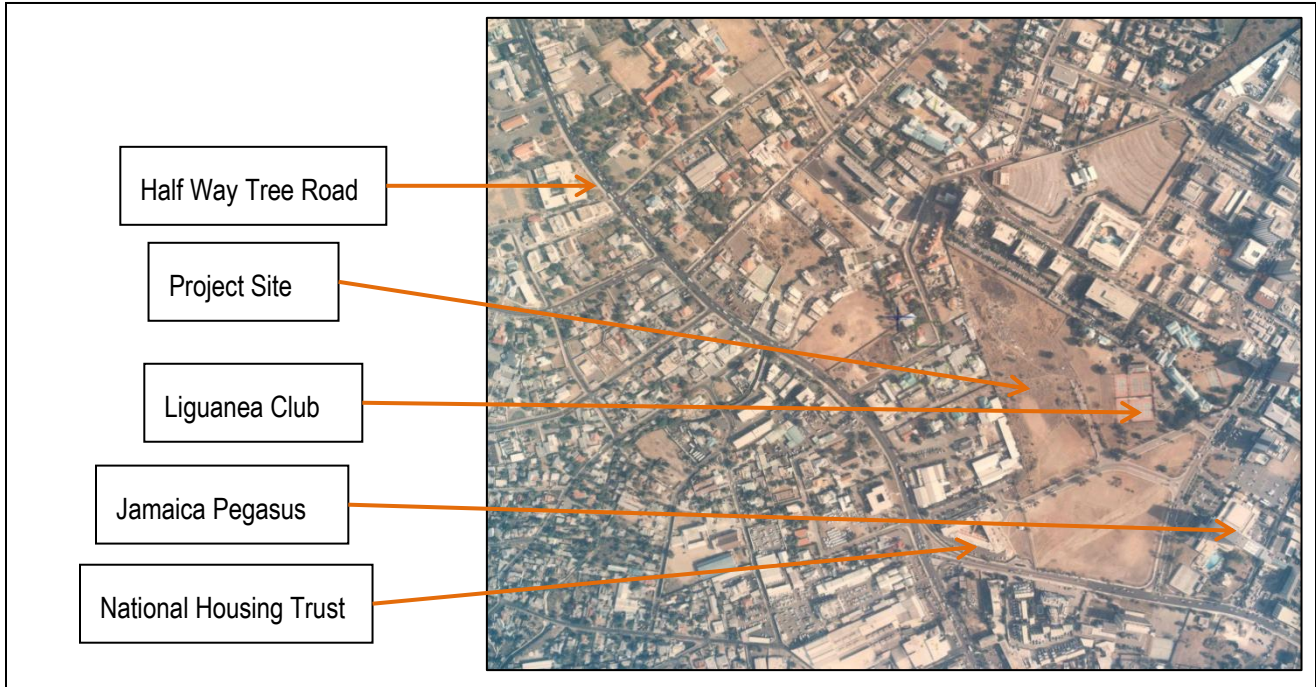
1: 25 000 Aerial Image of New Kingston – 1968 (Source: National Land Agency)

The image shows the development of Knutsford Boulevard and Park Boulevard and no development on the project site. Notice the creation of lots east of the site that were previously a part of the Knutsford Park Race Course.



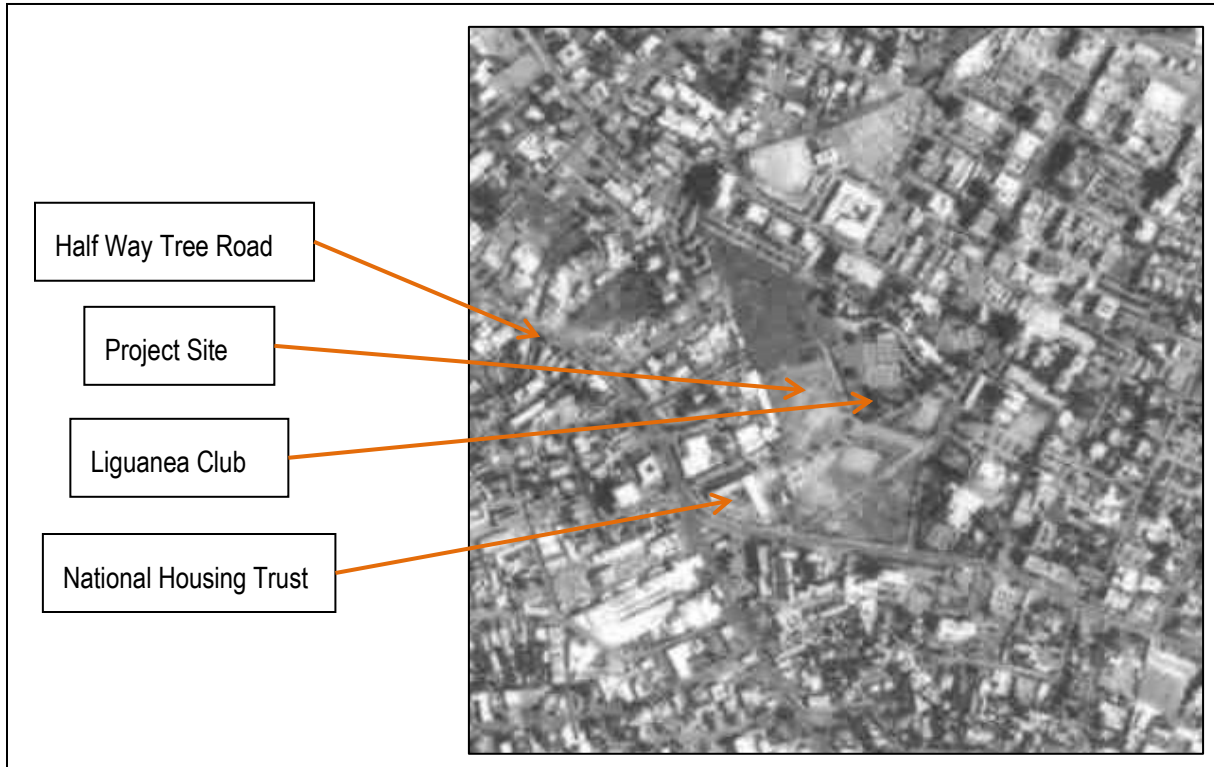
1: 50 000 Aerial Image of New Kingston – 1980 (Source: National Land Agency)

The image shows again no development on the project site. Notice the development of the New Kingston area east of the project site.



1: 5 000 Aerial Image of New Kingston – 1992 (Source: National Land Agency)

The image shows again no development on the project site although the site is clear. Notice the development of the National Housing Trust and the Liguanea Club southwest and east of the project site respectively. Notice also an increase in the overall development of the surrounding area, for example, the Jamaica Pegasus in the south east corner of the photograph.



1: 40 000 Aerial Image of New Kingston – 1999 (Source: National Land Agency)

The image shows that the project site is clear and there is still no development on the site. Notice that Emancipation Park is still not yet developed south of the site and the National Housing Trusts' parking building is still not yet developed west of the site.

APPENDIX II – ENVIRONMENTAL PERMIT TERMS AND CONDITIONS

(Attached as separate document)

APPENDIX III – COURTYARD BY MARRIOTT, JAMAICA DRAFT LEED SCORECARD

(Attached as separate document)

APPENDIX IV – SOIL INVESTIGATION REPORT

(Attached as a separate document)

APPENDIX V – SOIL PENETRATION TEST

(Attached as a separate document)

APPENDIX VI – STORM WATER POLLUTION PREVENTION PLAN

(Attached as separate document)

APPENDIX VII – MARRIOTT INTERNATIONAL INC. HUMAN RIGHTS POLICY STATEMENT

MARRIOTT INTERNATIONAL INC.

HUMAN RIGHTS POLICY STATEMENT

Preamble

Marriott International, Inc. acknowledges and respects the principles contained in the Universal Declaration of Human Rights. Marriott's Human Rights Policy reflects the Company's commitment to conduct its business in a manner consistent with these principles and to protect human rights within the company's sphere of influence. Marriott demonstrates global leadership in responsible workplace practices, and endeavors to conduct its business operations in a manner that is free from complicity in human rights abuses. The Company's core values and culture embody a commitment to ethical business practices and good corporate citizenship.

Ethical Business Conduct

Marriott's policies require that its business be conducted with honesty and integrity, and in full compliance with all applicable laws. Company policies establish clear ethical standards and guidelines for how we do business and establish accountability. All company associates are required to obey the law and comply with specific standards relating to legal obligations, ethics, and business conduct. The Company has clear accountability mechanisms in place to monitor and report on compliance with these directives.

Protection of the Rights of Children

Marriott condemns all forms of exploitation of children. The Company does not recruit child labor, and supports the elimination of exploitative child labor. Marriott also supports laws duly enacted to prevent and punish the crime of sexual exploitation of children. Marriott will work to raise awareness concerning such exploitation, and will cooperate with law enforcement authorities to address any such instances of exploitation of which the Company becomes aware. Marriott has a long history of supporting programs and partnerships that help at-risk young people and their families prepare for and find meaningful employment. Marriott will continue to focus on programs that help children break out of the cycle of poverty that makes them and their families vulnerable.

Protection of the Rights of Associates

Marriott supports and upholds the elimination of discriminatory practices with respect to employment and occupation, and promotes and embraces diversity in all aspects of its business operations. Marriott further supports the elimination of all forms of forced, bonded or compulsory labor and the freedom of association and the right to choose a collective bargaining representative, if desired. Marriott will also provide a safe and healthy working environment for all its associates.

Marriott International Inc. 2011

APPENDIX VIII – PUBLIC PRESENTATION

(Attached as a separate document)