



# Guyana Mixed Use Development in Georgetown, Republic of Guyana

Hilton International 5 Stars Hotel & Doubletree 4 Stars Suites  
Project Proposal

# Project Details

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- **Project Title: Hilton International 5 Stars Hotel & Doubletree 4 Stars Suites**
- **Name of Project: Guyana Mixed Use Development in Georgetown, Republic of Guyana**
- **Name of Developer: TROPICS (GUYANA) INC**
- **Registered Address: 217 South Road, Lacytown, Georgetown, Republic of Guyana**
- **Site: Tracts ‘X’ & ‘Z’ Pln. Thomas Lands, Georgetown -- GLSC Lease No. GLL-3790**
- **Email: s.elhaj@urbacon-intl.com**
- **Prepared by: UCC Trading & Contracting Inc.**
- **Date Prepared: 08 January 2025**

# Introduction



Tropics (Guyana) Inc. is a special purpose company incorporated under the Companies Act of Guyana to develop an exciting mixed-use development project nestled in the heart of Georgetown, Guyana, this project is designed to be a harmonious blend of luxury, functionality, and natural beauty.

The Project is Hilton International 5 Stars Hotel and Doubletree by Hilton Hyatt 4 Stars Suites, which is intended to be a benchmark architectural statement located on 12.2-acre (49,375 m<sup>2</sup>) parcel of land on the North facing Atlantic Ocean of Georgetown.

The development boasts a diverse range of components, catering to diverse guest needs and preferences. Complementing the short-term and long-term residential facilities is a state-of-the-art Conference Centre, equipped to host a myriad of events, from business conferences to cultural gatherings. Adding to the allure is a lavish Hotel that promises a premium hospitality experience for visitors. The project also features a Members Club, providing a refined space for socializing and recreational activities. The DoubleTree Suites Building further enhances the accommodation offerings, ensuring a comfortable and memorable stay for guests. Beyond the structures, the development emphasizes the importance of outdoor spaces. Lush landscapes, a swimming area, and carefully curated gardens will create a serene environment for residents and visitors alike. Outdoor terraces will provide a perfect setting for relaxation and enjoyment, enhancing the overall experience of the development. With meticulous attention to detail and a commitment to blending functionality with aesthetics, this mixed-use project in Georgetown, Guyana, is set to redefine urban living. It aspires to become a symbol of sophistication, offering a unique combination of residential, commercial, and recreational elements in a vibrant and inviting atmosphere.



GEORGETOWN



SITE

## Context

# Project Location

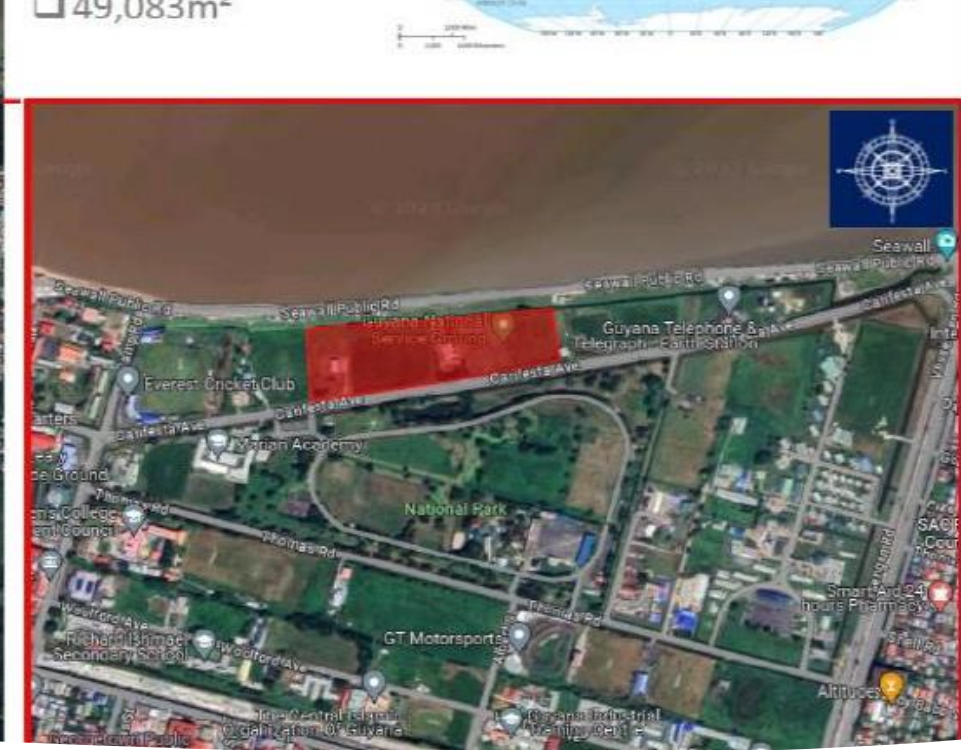
Georgetown is the capital and largest city of Guyana, situated on the northern coast of South America. It serves as the country's political, cultural, and economic hub. Founded in the 18th century by the Dutch and later controlled by the British, Georgetown showcases a rich blend of architectural styles reflecting its colonial history.

Georgetown is situated at the mouth of the Demerara River and features a picturesque waterfront. The city has a diverse population, reflecting the cultural mosaic of Guyana, with influences from African, Indian, European, and indigenous communities. Visitors can explore various markets, parks, and museums, gaining insight into the country's history, art, and traditions.



# Site Location





## Site Description

The land is held by the Developer, Tropics (Guyana) Inc. via Government Lease GLL-3790 for a period of 50 years commencing October 1, 2023 for the development and construction of a short and long-term luxury hotel and convention centre, which will include a ballroom and meeting rooms. The project will also feature food and beverage outlets, a retail area, fitness center, swimming pool, specialty restaurants, lounges, pool bar and grill and spa and wellness.

The total land area to be occupied by the Hotel Project is 49,375.65 m<sup>2</sup>.

The Project Site is bounded on the North by the Atlantic Ocean with sporadic bars and food stalls along the Seawall. Located along the Western boundary is the Council for TVET Secretariat and Ministry of Education Ground. To the South is Carifesta Avenue and the National Park and to the East is the St. Stanilaus College Playground. The present land-use at the site, playgrounds, pavilions and other small buildings.

# Location of Nearby Facilities

## MACRO SCALE ANALYSIS



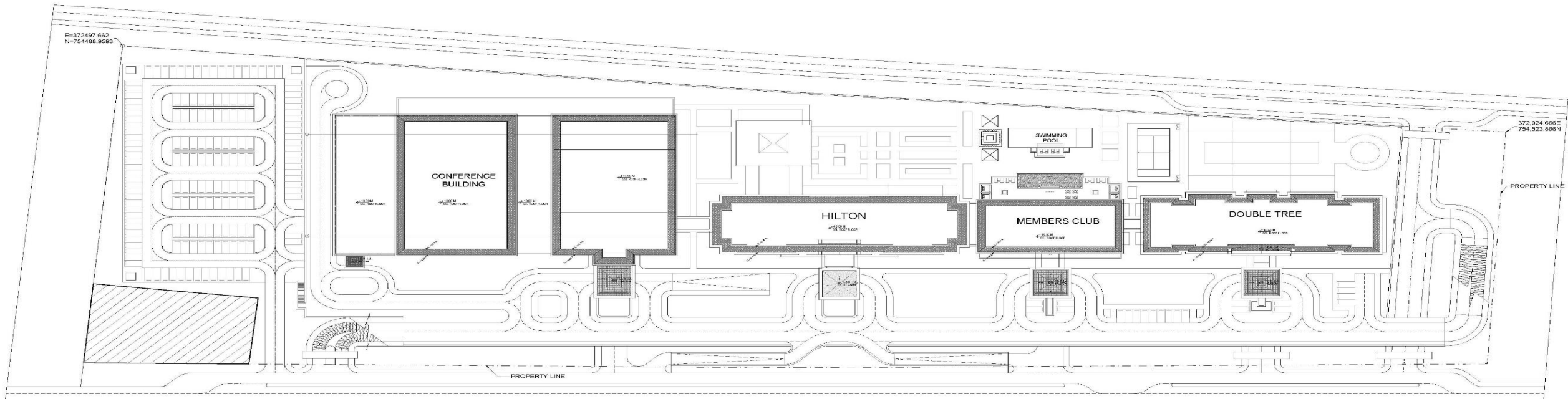
# Location of Nearby Facilities

	North	East	South	West
<b>Residential</b>	-	-	-	-
<b>Commercial</b>	Small Businesses (bars and food stalls) along Seawall	-	-	-
<b>Institutional</b>	-	-	-	Council For TVET Secretariat and Ministry of Education Ground
<b>Recreational</b>	-	St. Stanislaus College Playground	National Park	-
<b>Industrial</b>	-	-	-	-
<b>Mixed Use – State</b>	Seawalls, Public Road	-	CARIFESTA Ave Roadway	-

# Site Proximity

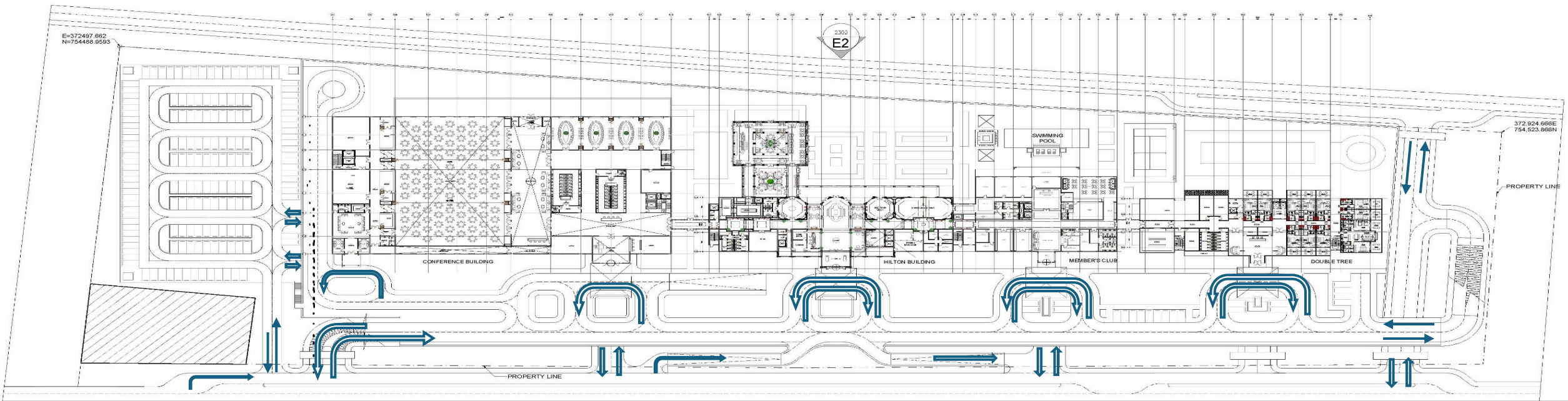
	<50 meters	50m-100m	101m-500m	501m-1000m	>1km
<b>Sensitive ecosystems e.g. Wetlands/Mangroves</b>		x			
<b>Protected Areas</b>			x		
<b>Major Water Courses</b>			x		
<b>Threatened or endangered flora and fauna</b>					x
<b>Residences</b>				x	
<b>Place of Worship</b>			x		x
<b>Schools</b>					
<b>Hospitals</b>					x
<b>River / Sea Defence</b>		x			
<b>Other – State</b>					

# Master Plan



A MASTER PLAN  
SCALE 1:750

# Roads & Buildings



E-372497.062  
N=754486.9593

2300  
E2

372.924.666E  
754.523.666N

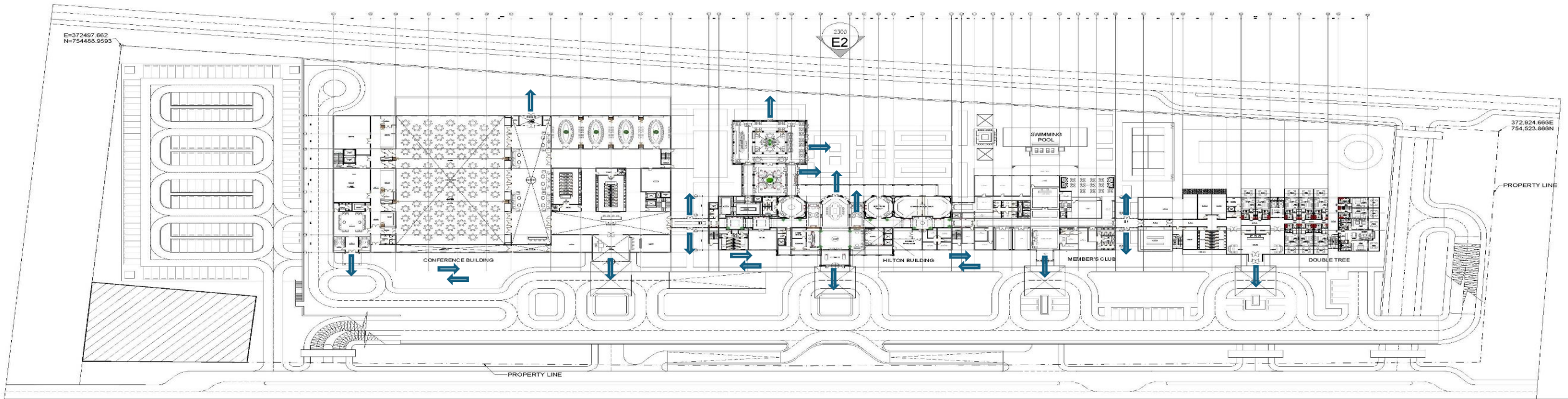
PROPERTY LINE

PROPERTY LINE

2100  
E1

A KEY PLAN - GROUND LEVEL  
SCALE 1:750

# Circulation System (Pedestrian)

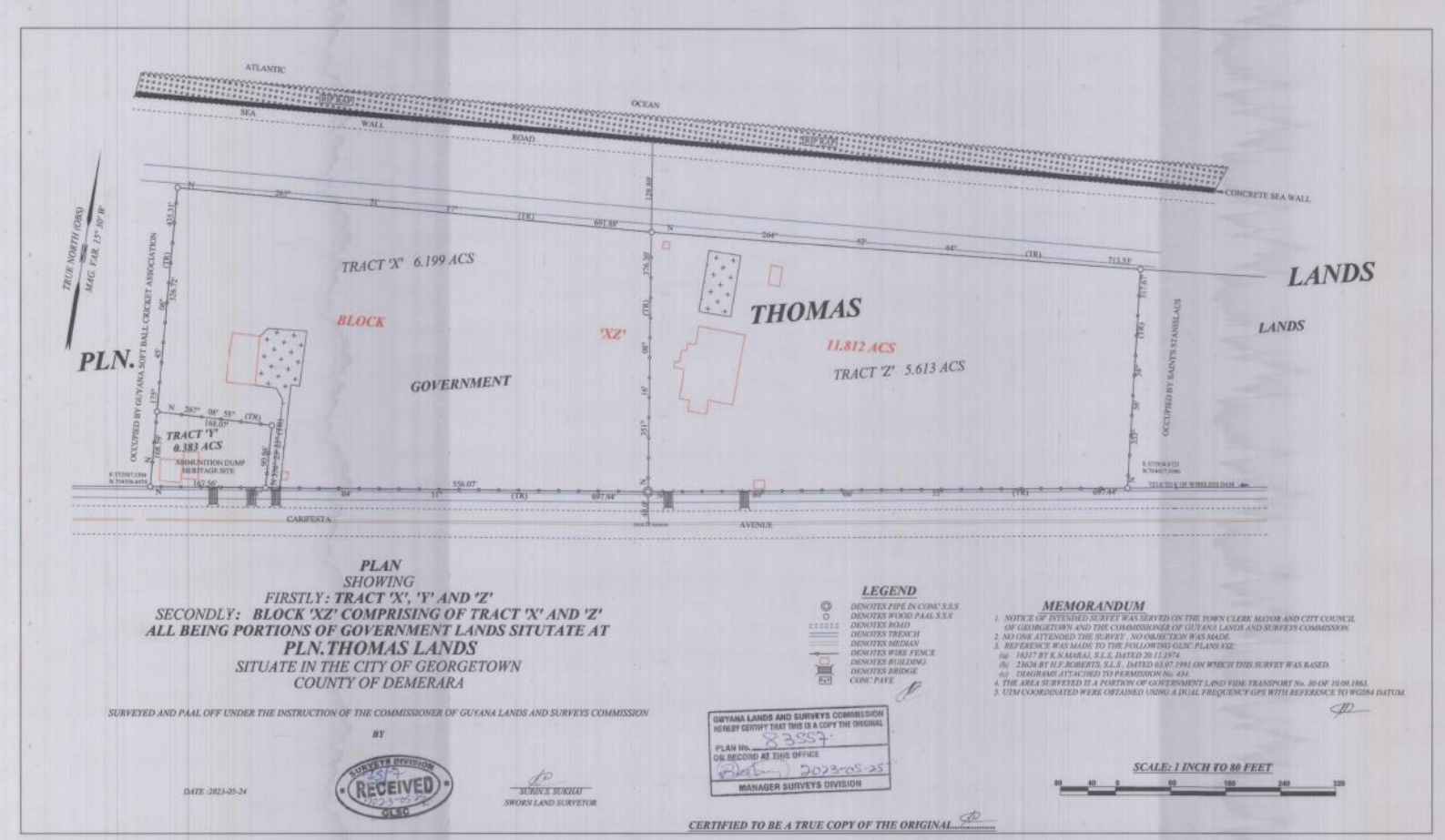


2193  
E1  
A KEY PLAN - GROUND LEVEL  
SCALE 1:750

# Master Plan



# Topography Report



# Drainage & Wastewater Management

## Access Hatches:

Access hatches will be installed above the false ceiling to facilitate convenient maintenance and inspection of drainage shafts within the apartments, promoting timely interventions and upkeep.

## Clean Out Points:

Clean out points will be provided at every change of direction in the suspended pipes, enabling thorough cleaning and maintenance of the system to prevent blockages and ensure optimal performance.

## Slope Design:

Proper slope design will be implemented across all drainage networks, promoting self-cleaning capabilities and efficient wastewater flow, essential for maintaining system functionality and hygiene standards.

The drainage pipes shall have a minimum slope of 1/100.

### **3. Foul Sewage Drainage**

Foul sewage effluents generated from WC flushing and bides will be collected through dedicated soil stacks and pipes, ensuring efficient conveyance to the external sewage networks for proper disposal and treatment.

### **4. Waste Water Drainage**

Wastewater drainage system in this project will include provisions for collecting waste generated from showers, lavatories, baths, and floor drains. This wastewater will be channeled through dedicated waste stacks and pipes, ultimately being discharged into the external sewage networks for proper disposal.

### **5. Kitchen Drainage**

The kitchen, will have a separate drainage system. This system will connect directly to the external sewage network through an automatic grease separator. The grease separator will be strategically located in a dedicated area or room, ensuring easy access for inspection and maintenance purposes.

### **6. Laundry Drainage**

The laundry, will have a separate drainage system. This system will connect directly to the external sewage network through a lint interceptor.

### **7. Planters Drainage**

All planters and green areas within the project and above the structure elements will have dedicated drainage systems. These systems will be designed to drain separately and connect directly to the external sewage network and /or storm water network.

# Drainage & Wastewater Management

## 8. Parking Drainage

Parking drains will be installed on basement floor levels to effectively manage runoff and drainage within parking areas. These drains will be connected to dedicated sump pits through sedimentation chambers, allowing for the removal of sediment and debris from the collected water. The water will then be pumped into the external sewage network via slow-down chamber(s) to ensure proper drainage and disposal. This comprehensive system helps maintain cleanliness and functionality within the parking facilities.

## 9. Sump Pit and Sewage Pump

Sanitary fixtures and drains located below road level will be connected to dedicated sump pits for efficient drainage. The drainage from toilets will be collected and directed to sewage sump pit(s). From there, it will be pumped into the external sewage network through a slow-down chamber, ensuring smooth flow and proper disposal.

Similarly, drainage from mechanical and pump rooms will also be collected in sewage sump pit(s) and pumped into the external sewage network.

To ensure reliability, a minimum of two submersible pumps will be provided for each 100% of the load, with one serving as the primary and the other as a standby.

These pumps will operate in an alternative sequence and will work together in case of unexpected load, ensuring uninterrupted drainage even during peak demand or in the event of pump failure. This redundancy enhances system resilience and minimizes the risk of disruptions.

The pump flow-rate shall be minimum (1.1 \* Incoming flow rate).

The sump pit minimum effective volume will be calculated according to the equation below:

$$V_h = \frac{Q \times 3.6}{4 \times Z_{max}}$$

Where:

Pump flow-rate [l/s]

V<sub>h</sub>: necessary, minimum accumulated volume between start and stop.

Z<sub>max</sub>: maximum number of starts per hour as specified by the pump or motor manufacturer.

# Drainage System Design Criteria

Minimum flow velocity	0.6 m/sec
Fixture trap seal fluctuation	± 25 mm of water column
Discharge loads	Drainage Fixture Units (DFU)
Stack maximum permissible flow	7/24 of total cross sectional area of the stack
Building drain and main sewer pipes	½ full to ¾ full
Minimum gradient in horizontal runs	1% (can be increased subject to the available ceiling height)

## Sanitary Drainage Pipe Size

The piping system is designed to ensure that it can adequately handle the recommended maximum permissible flow from all fixtures to achieve the following:

### Proper Sizing:

- Piping throughout the system is appropriately sized to accommodate the maximum flow rates expected from all fixtures. Measures will be taken to ensure that no branch flow exceeds the flow capacity of the stack, preventing overloading and blockages.

### Stack Sizing:

- If any branch loads exceed the maximum allowable branch discharge to the stack within the same branch interval, the stack size will be increased accordingly.
- This ensures that the stack can effectively handle the combined flow from multiple branches without compromising drainage efficiency.

# Drainage System Design Criteria

Compliance with UPC Tables:

- Sanitary drainage and vent horizontal pipes, as well as stack sizes, are determined in accordance with the relevant tables provided by the Uniform Plumbing Code (UPC).
- By adhering to these tables, the design ensures compliance with industry standards and regulations, guaranteeing the reliability and functionality of the drainage and venting system.

Sanitary drainage and vent horizontal pipes and stack size shall be according to UPC's following tables:

**TABLE C 401.1  
SIZE AND LENGTH OF VENTS**

SIZE OF SOIL OR WASTE STACK (inches)	FIXTURE UNITS CONNECTED	DIAMETER OF VENT REQUIRED (Inches)									
		1¼	1½	2	2½	3	4	5	6	8	
		MAXIMUM LENGTH OF VENT (feet)									
1½	8	50	150	—	—	—	—	—	—	—	
2	12	30	75	200	—	—	—	—	—	—	
2	20	26	50	150	—	—	—	—	—	—	
2½	42	—	30	100	300	—	—	—	—	—	
3	10	—	30	100	100	600	—	—	—	—	
3	30	—	—	60	200	500	—	—	—	—	
3	60	—	—	50	80	400	—	—	—	—	
4	100	—	—	35	100	260	1000	—	—	—	
4	200	—	—	30	90	250	900	—	—	—	
4	500	—	—	20	70	180	700	—	—	—	
5	200	—	—	—	35	80	350	1000	—	—	
5	500	—	—	—	30	70	300	900	—	—	
5	1100	—	—	—	20	50	200	700	—	—	
6	350	—	—	—	25	50	200	400	1300	—	
6	620	—	—	—	15	30	125	300	1100	—	
6	960	—	—	—	—	24	100	250	1000	—	
6	1900	—	—	—	—	20	70	200	700	—	
8	600	—	—	—	—	—	50	150	500	1300	
8	1400	—	—	—	—	—	40	100	400	1200	
8	2200	—	—	—	—	—	30	80	350	1100	
8	3600	—	—	—	—	—	25	60	250	800	
10	1000	—	—	—	—	—	—	75	125	1000	
10	2500	—	—	—	—	—	—	50	100	500	
10	3800	—	—	—	—	—	—	30	80	350	
10	5600	—	—	—	—	—	—	25	60	250	

For SI units: 1 inch = 25 mm, 1 foot = 304.8 mm

**TABLE 717.1  
MAXIMUM/MINIMUM FIXTURE UNIT LOADING  
ON BUILDING SEWER PIPING\***

SIZE OF PIPE (inches)	SLOPE, (inches per foot)		
	1/16	1/8	1/4
6 and smaller	(As specified in Table 703.2/ No minimum loading)		
8	1950/1500	2800/625	3900/275
10	3400/1600	4900/675	6800/300
12	5600/1700	8000/725	11 200/325

For SI units: 1 inch = 25 mm, 1 inch per foot = 83.3 mm/m

\* See also Appendix H, Private Sewage Disposal Systems. For alternate methods of sizing drainage piping, see Appendix C.

# Drainage System Design Criteria

## Drainage Flow Rate

Estimated flow rate for drainage system will be calculated based on BS-EN- 12056-2:2000 according to usage of appliances and system type

Waste water flow-rate (l/s)  $Q = K\sqrt{\sum DU}$

- Q = Drainage water flow-rate (l/s)  
 K = Frequency of use  
 $\sum DU$  = Sum of discharge unite (based on system IV)

**Table 3 — Typical frequency factors (K)**

Usage of appliances	K
Intermittent use, e.g. in dwelling, guesthouse, office	0,5
Frequent use, e.g. in hospital, school, restaurant, hotel	0,7
Congested use, e.g. in toilets and/or showers open to public	1,0
Special use, e.g. laboratory	1,2

Horizontal sloped pipe for specific size shall be calculated according to manning equation as the following:

$$Q = A \times \frac{1.486}{n} \times R^{2/3} \times S^{1/2}$$

- Where:  
 Q = Quantity rate of flow in cubic feet per second (cfs) A = Cross-sectional area of flow (ft<sup>2</sup>)  
 n = Coefficient representing roughness of pipe surface, degree of fouling and pipe diameter  
 R = Hydraulic radius (hydraulic mean depth of flow) (ft.) S = Hydraulic slope of surface of flow (ft. /ft.)

Page 10  
 EN 12056-2:2000

## 4.2 System types

The systems may be divided into four system types, although there are variations in detail within each system type [hence the need to refer to the national and local regulations and practice listed in annex A (informative)].

**System I Single discharge stack system with partly filled branch discharge pipes**  
 Sanitary appliances are connected to partly filled branch discharge pipes. The partly filled branch discharge pipes are designed with a filling degree of 0.5 (50 %) and are connected to a single discharge stack.

**System II Single discharge stack system with small bore discharge branch pipes**  
 Sanitary appliances are connected to small bore branch discharge pipes. The small bore branch discharge pipes are designed with a filling degree of 0.7 (70 %) and are connected to a single discharge stack.

**System III Single discharge stack system with full bore branch discharge pipes**  
 Sanitary appliances are connected to full bore branch discharge pipes. The full bore branch discharge pipes are designed with a filling degree of 1.0 (100 %) and each branch discharge pipe is separately connected to a single discharge stack.

**System IV Separate discharge stack system**  
 Drainage systems type I, II and III may also be divided into a black water stack serving WC's and urinals and a grey water stack serving all other appliances.

# Drainage System Design Criteria

Table 2 — Discharge units (DU)

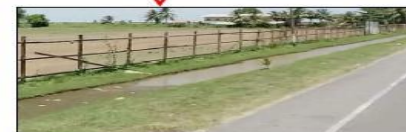
Appliance	System I	System II	System III	System IV
	DU l/s	DU l/s	DU l/s	DU l/s
Wash basin, bidet	0,5	0,3	0,3	0,3
Shower without plug	0,6	0,4	0,4	0,4
Shower with plug	0,8	0,5	1,3	0,5
Single urinal with cistern	0,8	0,5	0,4	0,5
Urinal with flushing valve	0,5	0,3	-	0,3
Slab urinal	0,2*	0,2*	0,2*	0,2*
Bath	0,8	0,6	1,3	0,5
Kitchen sink	0,8	0,6	1,3	0,5
Dishwasher (household)	0,8	0,6	0,2	0,5
Washing machine up to 6 kg	0,8	0,6	0,6	0,5
Washing machine up to 12 kg	1,5	1,2	1,2	1,0
WC with 4,0 l cistern	**	1,8	**	**
WC with 6,0 l cistern	2,0	1,8	1,2 to 1,7***	2,0
WC with 7,5 l cistern	2,0	1,8	1,4 to 1,8***	2,0
WC with 9,0 l cistern	2,5	2,0	1,6 to 2,0***	2,5
Floor gully DN 50	0,8	0,9	-	0,6
Floor gully DN 70	1,5	0,9	-	1,0
Floor gully DN 100	2,0	1,2	-	1,3

- \* Per person.
- \*\* Not permitted.
- \*\*\* Depending upon type (valid for WC's with siphon flush cistern only).
- Not used or no data.

## Storm Water Drainage

The storm water disposal system will include roof drain outlets, open area drains, and other necessary accessories to effectively manage storm water runoff.

A separate rain water drainage network will be provided to collect water from all roofs and open areas and will be conveyed to the internal storm water network and then discharged into the storm water drainage channel running parallel to the project as shown in the figure below.



# Drainage System Design Criteria

## 1. Storm Water Flow Rate

Estimated flow rate for storm water drainage shall be calculated based on equation below

Storm water flow-rate = Storm water intensity x Projected area x Service runoff coefficient

Where:

Storm water intensity = 329 mm/hr (As per ASHRAE and subject to municipality approval).

Service runoff coefficient for Asphalt, paving and roof =0.7-0.95

## 2. Storm Water Piping

Sizing of horizontal and vertical storm water piping shall be by UPC Tables 11-1 and 11-2 (Metric) based on 329 mm/hr. rainfall rate.

**TABLE 11-1 (Metric)**  
Sizing Roof Drains, Leaders, and Vertical Rainwater Piping<sup>2,3</sup>

Size of Drain, Leader Pipe, Flow,	Maximum Allowable Horizontal Projected Roof Areas or Square Meters at Various Rainfall Rates												
	25 mm/h	50 mm/h	75 mm/h	100 mm/h	125 mm/h	150 mm/h	175 mm/h	200 mm/h	225 mm/h	250 mm/h	275 mm/h	300 mm/h	
50	1.2	267.6	133.8	89.2	66.9	53.4	44.6	38.1	33.4	29.7	26.9	24.2	22.3
80	5.8	817.5	408.8	272.2	204.4	163.5	136.6	117.1	102.2	91.0	81.8	74.3	67.8
100	12.1	1,709.4	854.7	569.5	427.3	341.8	285.2	244.3	213.7	190.0	170.9	155.6	142.1
125	22.7	3,214.3	1,607.2	1,071.1	803.6	642.9	535.6	459.4	401.8	357.2	321.4	292.2	267.6
150	35.5	5,016.6	2,508.3	1,671.7	1,254.2	1,003.3	836.1	716.7	627.1	557.4	501.7	456.1	418.1
200	76.2	10,776.4	5,388.2	3,591.5	2,694.1	2,155.3	1,794.4	1,539.4	1,347.1	1,197.5	1,077.6	979.6	897.4

**Notes:**  
<sup>1</sup> Maximum discharge capacity, gpm (L/s) with approximately 1 3/4-inch (44 mm) head of water at the drain.

<sup>2</sup> For rainfall rates other than those listed, determine the allowable roof area by dividing the area given in the 1-inch/hour (25 mm/hour) column by the desired rainfall rate.

<sup>3</sup> Vertical piping may be round, square, or rectangular. Square pipe shall be sized to enclose its equivalent roundpipe. Rectangular pipe shall have not less than the same cross-sectional area as its equivalent round pipe, except that the ratio of its side dimensions shall not exceed 3 to 1.

**TABLE 11-2 (Metric)**  
Sizing of Horizontal Rainwater Piping<sup>1,2</sup>

Size of Pipe, mm	Flow at 10 mm/m Slope, L/s	Maximum Allowable Horizontal Projected Roof Areas Square Meters at Various Rainfall Rates					
		25 mm/h	50 mm/h	75 mm/h	100 mm/h	125 mm/h	150 mm/h
80	2.1	305	153	102	76	61	51
100	4.9	700	350	233	175	140	116
125	8.8	1,241	621	414	310	248	207
150	14.0	1,988	994	663	497	398	331
200	30.2	4,273	2,137	1,424	1,068	855	713
250	54.3	7,692	3,846	2,564	1,923	1,540	1,282
300	87.3	12,375	6,187	4,125	3,094	2,476	2,062
375	156.0	22,110	11,055	7,370	5,528	4,422	3,683

Size of Pipe, mm	Flow at 20 mm/m Slope, L/s	Maximum Allowable Horizontal Projected Roof Areas Square Meters at Various Rainfall Rates					
		25 mm/h	50 mm/h	75 mm/h	100 mm/h	125 mm/h	150 mm/h
80	3.0	431	216	144	108	86	72
100	6.9	985	492	328	246	197	164
125	12.4	1,754	877	585	438	351	292
150	19.8	2,806	1,403	935	701	561	468
200	42.7	6,057	3,029	2,019	1,514	1,211	1,009
250	76.6	10,851	5,425	3,618	2,713	2,169	1,807
300	123.2	17,465	8,733	5,816	4,366	3,493	2,912
375	220.2	31,214	15,607	10,405	7,804	6,248	5,202

Size of Pipe, mm	Flow at 40 mm/m Slope, L/s	Maximum Allowable Horizontal Projected Roof Areas Square Meters at Various Rainfall Rates					
		25 mm/h	50 mm/h	75 mm/h	100 mm/h	125 mm/h	150 mm/h
80	4.3	611	305	204	153	122	102
100	9.8	1,400	700	465	350	280	232
125	17.5	2,482	1,241	827	621	494	413
150	28.1	3,976	1,988	1,325	994	797	663
200	60.3	8,547	4,273	2,847	2,137	1,709	1,423
250	108.6	15,390	7,695	5,128	3,846	3,080	2,564
300	174.6	24,749	12,374	8,250	6,187	4,942	4,125
375	312.0	44,220	22,110	14,753	11,055	8,853	7,367

**Notes:**

<sup>1</sup> The sizing data for horizontal piping are based on the pipes flowing full.

<sup>2</sup> For rainfall rates other than those listed, determine the allowable roof area by dividing the area given in the one (1) inch/hour (25 mm/hour) column by the desired rainfall rate.

# Drainage System Piping materials

S/N	Service	Material
1	Gravity sewage external drainage pipes (Between manholes)	uPVC for pipe up to 200mm HDPE for pipe greater than 200mm
2	Gravity storm external drainage pipes (Between manholes) or under raft	HDPE pipes with butt welding joints
3	Gravity internal sewage drainage pipes	PP silent pipes and fittings
4	Gravity internal storm water drainage pipes	HDPE pipes with fusion welded joints
5	Pressurized line	HDPE Pressure pipes
6	High temperature drainage (Ground Kitchen & Laundry)	HDPE pipes with fusion welded joints / cast iron
7	Vent pipes	uPVC
8	Condensate drain pipes	PVC SCH40 with thermal insulated

# Project Components

- Hilton Hotel: GF plus 10 Floors (259 keys).
- Members Club: GF plus 2 floors.
- Conference Centre: GF plus First Floor.
- DoubleTree Hotel Suites: GF plus 10 Floors (130 keys).
- Basement Parking: 275 cars
- Total Parking (basement + outdoor parking): 459 cars
- Landscape and Hardscape elements complement the area and the project style.
- Bar / Restaurant could be considered in the rooftop of one of the buildings.
- All service entrances will be blocked from guest views.

# Project Design

The implementation of the hotel facility will follow the standard four-phased approach used in the construction sector. They are as follows:

- **Phase I** Design phase.
- **Phase II** Pre-construction phase
- **Phase III** Construction phase
- **Phase IV** Operation phase

# Design Phase

As with many construction projects, the conceptual design for the project was an iterative process with the goal of balancing cost, quality, and timely delivery of the project. Several architectural designs and construction materials were examined during the design process. The project's engineer has completed the architectural concept drawings which have been submitted to regulatory agencies for approval to obtaining all essential construction permits from the Mayor and the City Councillors of Georgetown (M&CC), Environmental Protection Agency (EPA), and Central Housing and Planning Authority (CH&PA) was also a crucial step in this procedure. The duration of this phase is expected to take four months.

# Design Principles & Strategies

**Integration with  
Nature**

**Functional  
Zones**

**Visual  
Continuity**

**Community  
Engagement**

# Pre-Construction Phase

This phase will entail site development activities such as removing all vegetation, plants and small trees, existing buildings from the site where the hotel will be constructed as well as subgrade excavation. All internal and external reinforced concrete drains will be built during this stage allowing the plot to be backfilled to the necessary building levels. Approximately 40,000 cubic yards of white sand will be required to bring the site up to design grade during these works. As a result, sand trucks and small wheel loaders (bobcats) will be common on the job site during this phase. This phase is planned to last for two months.

# Construction Phase

The Project's will total Built-up area is 69,719 m<sup>2</sup> with total coverage area of 11,828 m<sup>2</sup>, Hilton Hotel is GF + 10 floors, and Doubletree suites is GF + 10 floors, and will utilize materials consistent with international standards and specifications including but not limited to mass and reinforced concrete, concrete blocks, bricks, pavers, glass, timber, structural steel, plastic and composite materials. The sub-structure and super-structure works will commence in this phase simultaneously with the external works. It is anticipated that during Construction 800 to 1000 persons would be employed, 95% of which are expected to be Guyanese nationals. It is expected to have the building completed in the duration of twenty-two months.

The main adverse impacts anticipated during the construction phase of the project relate to noise and dust generation, waste management, workers health and safety, and management of hazardous materials (fuel) and traffic to and from the project site. The construction works will be contracted out and the contractor will be required to comply with the EPA's requirements and construction best practices to ensure these impacts are avoided or minimized. The developer will monitor the contractor's activities to ensure strict adherence.

CONSTRUCTION
Mobilization
Enabling Works
Site Clearance & Enabling Works
Substructure Works
Partitioning Works
MEP works
Super-structure Works
Internal Finishes
Installation of OS & E
Underground Utilities works / Infrastructure
External Works
Installation of Landscape Features
Installation of Art Works
Installation of Gym Equipment
Installation of Spa Equipment
Snagging and Desnagging
Testing and Commissioning
Project Handing Over

# Guide for Project Stages from Raw Material to Completed Project

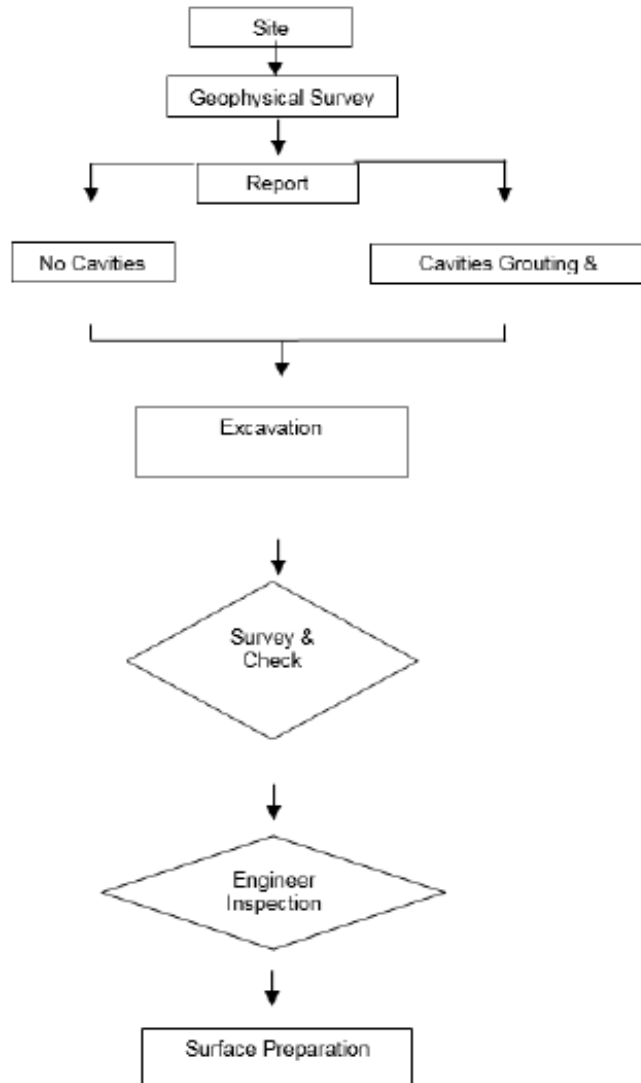


These are the typical stages in any construction project. Good planning at the beginning and anticipation of contingencies will help the entire process go much more smoothly.

# Estimated Project Duration

HILTON - GUYANA MIXED USE DEVELOPMENT - BASELINE PRORAMME	DURATION (months)
GENERAL PRELIMS & GENERAL REQUIREMENTS	~31
AUTHORITY APPROVALS	~2.5
MOBILIZATION	1
DESIGN	~7
ENGINEERING	~7
PROCUREMENT	~16.5
CONSTRUCTION	22
PROVISIONAL SUM	~19
SNAGGING & DE-SNAGGING	~4.7
TESTING & COMMISSIONING	~4.7
HANDING OVER	~5.1

# Work Sequence Flow Chart (Earthworks)



# Description of Development Stages

- Vegetation Clearing and Earth Works – Removal of Topsoil, Excavations
- Site Office Mobilization – Roads Establishment and Cabin Mobilization
- Construction – Construction Waste Management, Carpentry, Shuttering and Formwork, Concrete Works, Blockwork, Painting, MEP Works, Dewatering, Plant & Equipment Operation
- Demobilization of Temporary Structure
- Operation – Facilities Management, Waste Management, Accommodation, Catering, Events

# Operation Phase

The operational phase of the project will entail the services provided by the Hilton Hotel (Standard Rooms: 236 keys – 1 Bed Suite: 20 keys – 2 Bed Suite: 2 keys – Presidential Suite: 1 key), Doubletree suites (Studio: 70 keys - 1 Bedroom: 35 keys - 2 Bedroom 41 keys – 3 Bedroom: 6 keys) as well as disability outfitted rooms, all day dining, specialty restaurant, kitchen, pools, kids pool, retails, conference center, members club, spa, beauty salon, gym, bar, social lounge, restaurant and bar, meeting rooms, social lounge, fitness center, internet and communication links, room service and guest laundry and spacious parking spaces. The facility's main source of electricity will be provided by the Guyana Power and Light (GPL). In the event of a power outage, standby generators will be in place to accommodate the transition. Also, the facility will be connected to the Guyana Water Inc (GWI) water supply network, in addition to a well being dug on site with a filtration system to supply the finished project. However, fixed water storage infrastructure will be in place to facilitate emergency needs. Wastewater generated during the operation of the facility will be treated via a wastewater treatment plant before final discharge. Fecal sludge will be contained via a septic system and periodically emptied by a local sanitation service provider. Likewise, solid waste will be contained and managed onsite via storage receptacles and will be retrieved regularly by a contracted local sanitation service provider for final disposal at an authorized solid waste facility. Approximately 70 to 80 permanent jobs with several part-time roles would be created, 90% of which are expected to be Guyanese nationals. The design life for the project is 100 years.

# Estimated Workforce/ Phase

- Mobilization – 20
- Construction – 800
- Demobilization – 20
- Operation – 450

# Environmental Impacts

Most of the project's impacts will occur during the pre-construction and construction phases. The project is committed to minimize all the impacts that are identified. The impacts as well as the necessary preventive and mitigation and control measures for each phase of the project are discussed below;

- Exhaust emissions and Fugitive Dust ( Air Quality)
- Noise pollution
- Surface Water contamination
- Management of Solid and Liquid Waste
- Domestic waste
- Sanitary wastewater/sewage waste
- Construction waste
- Concrete waste
- Cleared Vegetation

# Estimated Waste Values

Resource	Quantity (Estimated)
Solid waste	0.219 kg/m <sup>2</sup>
Sewage Water	320m <sup>3</sup> /day
Wastewater	190m <sup>3</sup> /day
Water consumption	350m <sup>3</sup> /day
Electric supply	10MVA
Back-up Power generation	3 generators for emergency and essential loads ; with fuel storage values  1. 1875KVA (20,000 L)  2. 1256KVA (15,000 L)  3. 939KVA (10,000 L)

# Emissions and Fugitive Dust ( Air Quality)

Dust will be generated from a variety of sources during construction, including vehicles transporting aggregates, truck loading and unloading, excavation activities, the construction and operation of support facilities such as material stockpiles, and debris deposits from vehicles exiting the construction zone. Most of these effects, however, are likely to be localized and can be avoided or eliminated.

## **Impacts associated with Fugitive Dust**

Construction activities, soil type, moisture content, and wind speed will all have an impact on dust generation during dry periods. Long-term exposure to dust pollution can cause respiratory and ocular irritations in workers and the general population. Wind can also cause dust to be created or elevated from material stockpiles, especially in dry conditions. These effects are manageable and expected to be localized and short-term. They can have serious consequences if not managed properly.

# Mitigation Measures associated with Fugitive Dust

To limit the influence of dust on the project environment, equipment that produces large amounts of dust should be located away from neighboring structures. Dust masks, respirators, and other appropriate personal protective equipment will be provided for personnel working in dusty areas (e.g., stockpile area, cement ransom, or ready-mix service). During dry months, the access route will be checked for dust particles that may become airborne as vehicles and equipment pass by. If dust pollution occurs, soaking will be used on a regular basis. Application of aggregate and compaction will be applied on busy roads to reduce dust production. When transporting material, the loaded truck tray will be covered to reduce dust emissions. To prevent wind influence on materials, the material stockpile should be kept to a minimum height. For materials susceptible to wind, a maximum stockpiling height of 10 feet will be used, while for materials impervious to wind, a maximum stockpiling height of 15 feet will be used. To prevent any loose material from being carried away by wind or rain, all material stockpiles will be adequately covered.

# Exhaust Emissions

The usage of diesel and/or gasoline-fueled heavy-duty equipment will result in combustion emissions during construction. Combustion emissions will be small, temporary, and limited to the region surrounding building activity.

There will be emission from the use of the back-up power generation though. At 50% of the generator load of 100k the following levels are estimated: Particulate Matter – 0.03 G/Kwh; Carbon Monoxide – 2.06 G/Kwh; Carbon Dioxide – 696.2 G/Kwh; Oxide of Nitrogen – 3.18 G/Kwh, Nitrogen Monoxide - 3.04 G/Kwh, and Nitrogen Dioxide - 0.18 G/Kwh.

# Mitigation of Exhaust Emissions

**Mitigation measures to reduce potential impacts associated with exhaust emissions.**

Maintaining construction equipment in accordance with manufacturer's standards so that it runs at maximum efficiency and emits the least amount of pollution. A maintenance log for equipment/machinery will be used to document all maintenance actions. Once dormant, all equipment and machinery will be shut off. Erection of dust screen, paving of temporary internal roads and providing workers with dust masks.

Trucks transporting aggregates to the site will be required to cover the trays. During operation the generators will be maintained/serviced as required to minimize emissions.

Air quality monitoring will be conducted, periodically, to ensure that the project is compliant to air quality standards.

# Noise Pollution

During the construction phase, noise will be created mostly by fuel-powered generators and heavy-duty equipment and machinery. These consequences are unavoidable, and they are expected to be brief and confined.

## **Impacts associated with Noise.**

Noise-induced hearing loss can occur when noise levels exceed the globally acceptable standard of 90 dB.

# Mitigation Measures to Reduce Impact of Noise Pollution

The Developer will mitigate the potential consequences of noise during the construction period by maintaining noise levels below the EPA's set limit of 90 decibels during the day and 75 decibels at night. Sensitive receptors will be identified prior to the start of the project. Using best practices on-site to reduce occupational noise levels and providing staff with noise protection equipment. Obtaining hearing protection, such as earplugs, for personnel who are exposed to excessive noise. Regular breaks will be given to people that work with noisy equipment. Wherever possible, efforts will be made to ensure that machinery and equipment are operating efficiently and that the manufacturer's mandatory muffler devices have been fitted. To the greatest extent possible, night work will be avoided.

Noise monitoring will be conducted to ensure that the project is within the specified noise limits.

# Surface Water

Earthworks linked with construction activities such as foundation excavation and primary and secondary drains may cause soil erosion and sedimentation. Improper waste disposal (liquid and solid) and fuel/lubricant management might also endanger surface water, which the Developer will prevent.

## **Mitigation measures to reduce potential impacts associated with surface water pollution.**

To prevent excessive dirt deposits and protect watercourses and quality, the Developer will appropriately cover material stockpiles and excavated materials in a specified area away from water bodies. Waste storage stockpiles or stockpiled material will be positioned at least 10 meters away from any watercourse and surrounded by a toe berm. The Developer will reduce and contain suspended sediment (also known as Non-Filterable Residue) in the construction zone. During concrete pours, the Developer will adopt adequate containment measures to guarantee that uncured concrete or concrete leachate does not enter any watercourses or drainage systems. Sediment traps are one means of prevention that will be utilized on site. Proper spill control measures will be put in place to prevent soil contamination which has the potential to result in surface water pollution. To prevent hydraulic fluid and/or fuel leaks from entering water bodies, the Developer will place pumps and generators on borated polyethylene sheeting. Additionally, the Developer will build a perimeter reinforced concrete drain in the early stages of the project to collect all runoff.

# Management of Liquid and Solid Waste

Waste Management Plans will be prepared for each phase to ensure that waste management methods are clearly outlined, given the kind and quantity of waste to be generated during both stages of the project. Each Waste Management Plan will include a description of the types and volumes of waste that will be generated, waste minimization opportunities, waste management methods, provisions for hazardous waste stream collection, storage, and disposal, and recordkeeping practices, such as manifest and waste tracking forms. This strategy will guarantee that waste created during construction is properly handled and reduced in accordance with EPA rules. Stripped vegetation, concrete forms, packaging materials, pallets, plastics, waste oil, filters, lubricants and hydraulic fluids, concrete, food, sewage and wastewater are some of the materials are expected to be generated during construction. All waste generated by the project will be carefully managed in accordance with applicable laws and regulations, corporate policies, and international standards. The Developers technical and environmental team will perform frequent monitoring and inspections during project construction to guarantee compliance with the plan. Similarly, the Developer will ensure that waste management methods are properly executed during the facility's operations. The Waste Management Plan will incorporate specific strategies to effectively manage the waste streams generated by the project.

# Impacts Associated with Improper Disposal of Waste

Waste heap piles are typically an eyesore and can detract from the aesthetics of any setting. Improper trash disposal, particularly of food waste, can raise the risk of Occupational Safety and Health hazards, as well as produce unpleasant odors and attract vermin. Waste mismanagement can result in secondary pollution and poisoning of land and water.

## **Mitigation measures to reduce potential impacts associated with improper waste disposal.**

Reduce the amount of waste that needs to be disposed of. As a result, opportunities for reusing 'waste' materials will be investigated on the spot. Organic waste (vegetation, topsoil), inert garbage (plastics, food boxes, rubber, etc.), and hazardous waste will be separated from each other. Hazardous and inert trash will be kept in covered bins. The Developer will collect and engage certified local service providers to transport and dispose of waste generated on the building site to a certified Landfills.

# Domestic Waste

- Littering and burning of waste products will be prohibited in the construction zone.
- The Developer will clean up the work area on a daily basis to keep it tidy.
- Waste materials will be collected and stored in bins on site.
- Domestic waste will not be stored on-site for more than 7 days.
- The Developer will engage a local service provider for transfer of garbage to a designated Landfill.
- Poorly managed rubbish receptacles may contain bugs and even illnesses carrying vectors, therefore, garbage receptacles will be washed regularly.

# Sanitary Wastewater/Sewage Waste

At the jobsite, a sufficient number of portable toilets will be installed and serviced on a weekly basis. To avoid secondary entrance and probable pollution/contamination, the waste storage location will be positioned away from water bodies. Sewage will be collected to an authorized sewage treatment plant.

# Construction Waste

The Developer is aware that the site's storage capacity is limited, and that storing enormous stockpiles is not ideal. The Developer will look at all options for reducing, reusing and recycling building waste as deemed feasible. Building debris and other garbage will not be allowed to accumulate on the work site. To avoid accumulation, the developer will remove it at a minimum bimonthly.

# Concrete Waste

For 48 hours following placement, fresh concrete will be kept away from any authorized watercourse. Cement or new concrete containers or lorries will be washed at a designated location. Only licensed and designated disposal locations will accept concrete waste, including wastewater from batching or cleaning. All cement-contaminated effluent from cleaning or mixing will be treated as poisonous and kept out of any watercourse for at least 48 hours to allow the pH of the water to return to normal.

# Cleared Vegetation

During mobilization, the Developer will stockpile cleared vegetation and other debris in the construction zone before transporting it to the Designated Landfill. Proper project planning will ensure that soil is not left bare for extended periods to prevent soil erosion.

# Fuel, Lubricants and Other Hazardous Materials

Due to fuel and lubricants being classified as hazardous substances, special consideration must be given to their transportation, handling, and storage. During project construction, appropriate management actions will be implemented to reduce risks to the environment and human health, as well as to avoid contamination of nearby surface waterways. A Chemical Management Plan will be formulated to ensure proper chemical management and containment. Any fuel storage onsite will be placed at a safe distance from the surface waterways, site office, and work areas. Long-term storage spaces will be covered to keep rain out and will have secondary containment and an impervious base. Fuel will be delivered to work areas as needed or in small quantities during project building and operations to reduce the danger of spills. Signage, fire extinguishers, and/or sand buckets will be put in and around the fuel storage locations during both phases. The type of fuel contained in tanks will be labelled, and 'No Smoking' and 'Highly Flammable' will be prominently displayed. Fuel storage containers will be checked for leaks on a regular basis during both phases. When handling fuel during both phases, extra caution will be taken to avoid spills and leaks. Drip pans will be installed under the equipment during both rounds of refilling to prevent contamination and subsequent fuel runoff due to leaks. Regular maintenance will be performed during both stages to ensure the proper working of machines and equipment and to prevent needless leaks. Spill kits will be accessible during both phases in the event of spills. Workers, mechanics, and other personnel will be instructed on the correct use of spill kits, as well as the safe handling of fuel and lubricants, during both phases. A simulation spill clean-up exercise is included in the training in proper fuel management methods.

# Handling of Materials and Fabricated Items on Site

All materials will be transported by either rigid or articulated truck using suitable equipment for unloading.

To prevent damage to materials stored in site, materials will not be stored on ground directly, but it will be stored on temporary materials of wooden or steel pieces or similar materials. It is not allowed to store materials on top of each other directly.

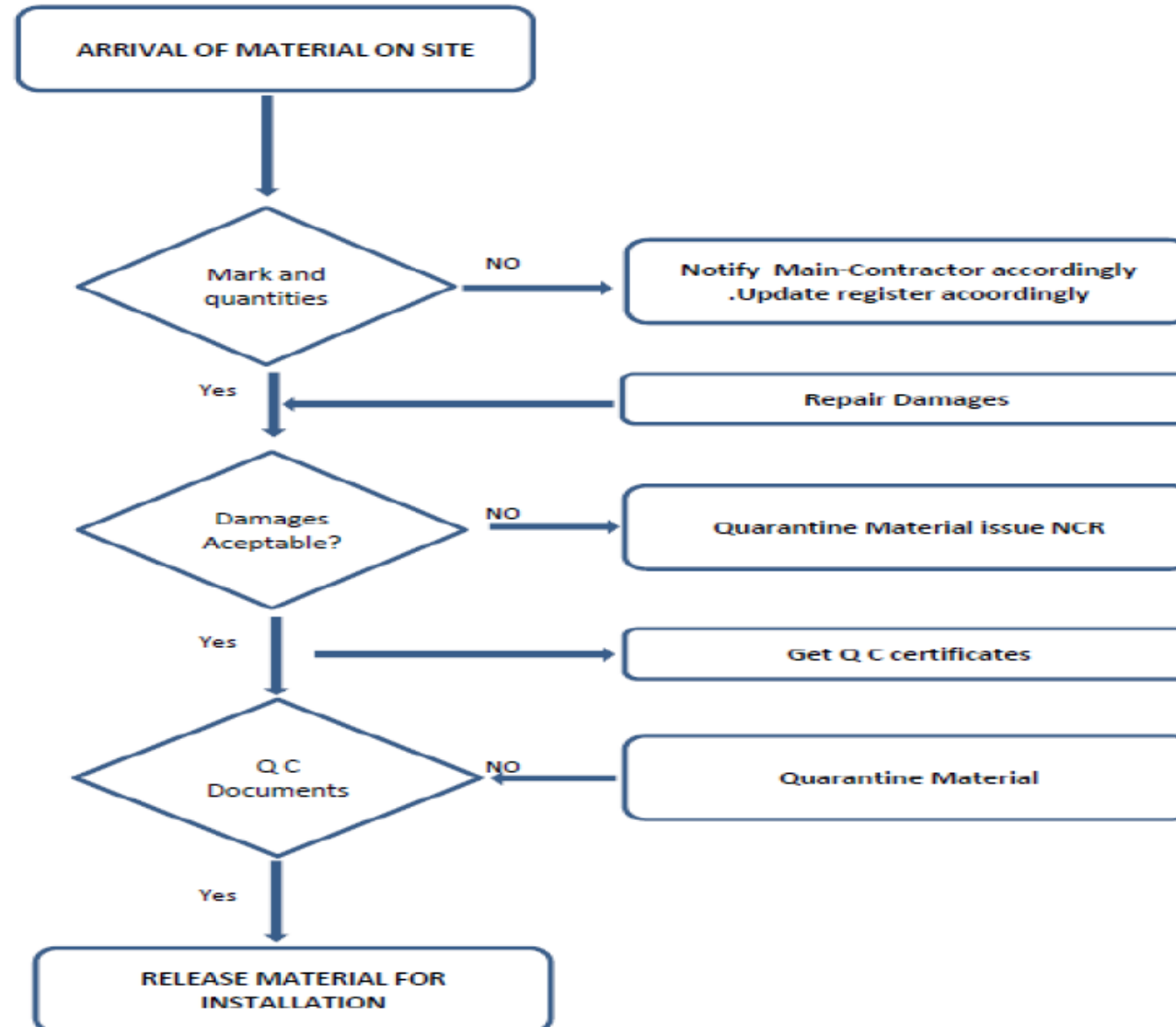
Small materials will be off-loaded in the storage area and shifted to the erection location

marks and quantities of the materials as detailed in the material shipment list.

There is no damage to the material other than ordinary damage to the paint due to transportation. Each Angle will be checked all around and each major element out of group of members will be tagged and released for use. A schematic presentation for the handling of materials at fabrication yard is given below.

means of tele-handler. Large beams and/or trusses will be off-loaded as close to the erection location as possible by means of Mobile / Crawler crane. They will be stored as per attached layout. Upon arrival of materials to site they will be inspected by the Material Supervisor, the Contractor Inspectors and the Engineer Inspectors. Inspection will include the following:

# Handling of Materials and Fabricated Items on Site



# Storage of Materials

In principle there are storages for the materials:

Arrival storage Area for the materials when they are off loaded from the trucks and registered. The materials will be inspected at this location and certificates of release at the factory will be reviewed. Materials that need repair work will be tagged and repaired at this location.

Main storage Area for the materials which has its QC acceptance and considered ready for erection.

Quarantine storage where the quarantined materials will be kept. Original pieces sent to site will be marked to facilitate assembly during erection in site.

# Health, Safety and Environmental – Managing Groundwater Quality

When employing active sump pumping techniques, it is anticipated that the groundwater extracted shall have elevated turbidity and/or suspended solids. In order to address the issue, the following shall be implemented;

- Dewatering wells shall be properly installed with filter aggregates around the annulus of the well screen and borehole. These shall also be developed Extensively.
- Trenches shall be lined with washed crushed gravel and shall be covered with geotextile / polyethylene sheets to avoid clogging and /or backfilling during the excavation works.
- The sump pit will be installed with at least two chambers, with the first chamber being the receiving pit of the surface water which will still the water and allow settlement of solids; and the pumping equipment will be installed in the last chamber where clear water would overflow into.
- Use of settlement tanks, and/or settlement pond, prior to final discharge to the manhole.

Regular water quality sampling shall be implemented – weekly tests for TSS and Turbidity, and monthly test for the full site.

# Health and Safety Management

Employees, contractors, visitors, and the general public may be exposed to health and safety concerns as a result of the project's activities. The Developer will ensure that plans to handle health and safety hazards unique to construction and operation activities are included in the Health, Safety, Security, and Environment (HSSE) Plan during the construction period. During the hotel's operations, The Developer will ensure that suitable HSSE safeguards are in place for its guests and employees. Identification of health and safety hazards, mitigation measures to protect workers and the public, risk categorization, HSSE procedures, training, and other controls and mitigation measures (for example, personal protective equipment, training, management programs etc) will all be part of the plans. Onsite, the HSSE Plans will be accessible to ensure that workers understand the hazards unique to construction and operation activities, as well as how to prevent mishaps, the implementation of the applicable plans will limit or minimize health and safety implications. Training will be conducted on all impacts identified on site to ensure that the project team is aware of the impacts and the mitigation measures

# Traffic Management

The hotel construction will result in an increase in traffic on nearby roadways. Although the Ministry of Public Works and the Guyana Police Force are responsible for traffic control on public roadways, it will be an important concern for the project. The Developer will produce a Traffic Management Plan for the project's construction period and will take steps during the operational phase to guarantee that traffic to and from the hotel is properly managed. All drivers will be briefed on safe driving techniques as part of the traffic management plan. Traffic warning signs will be placed near the project site, especially during construction. When heavy transport vehicles arrive and exit the site, traffic control such as a traffic marshal will be used.

When carrying huge and heavy construction equipment or materials, traffic escorts such as the Guyana Police Force will be utilized. Heavy machinery and commodities will not be transported during peak hours and changing schedules so that certain heavier vehicles can drive at night to relieve traffic congestion during the day.

# Conclusion

The Developer, Tropics (Guyana) Inc. is pursuing the development of a Hilton 5 Stars Hotel and Doubletree 4 Stars Suites and Residential Unites. The Developer has an exemplary level of expertise in mixed-use project development. It has a wealth of knowledge and experience in planning and managing the overall development of the turnkey projects. It will coordinate with architects, contractors, and private and public stakeholders to position Hilton and Doubletree brand as one of the leading hotel developments in Guyana. The project will capitalize on both Hilton and Hyatt's customer base and internal management systems to drive the market share and promote exposure. The development will not only target travelling professionals and stakeholders associated with Guyana's emerging oil and gas sector but persons travelling for leisure and tourism.