ENVIRONMENTAL AND SOCIAL ASSESSMENT STUDY OF HOUSING SCHEMES ALONG EAST BANK DEMERARA, REGION NO. 4

LO-1031 BL/GY: REFORMULATION OF THE ROAD NETWORK, UPGRADE AND EXPANSION PROGRAM
(ADEQUATE HOUSING AND URBAN ACCESSIBILITY PROGRAM)

Prepared for:

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Table of Contents

Acronyms

AMP	Access Management Plan
AHUAP	Adequate Housing and Urban Accessibility Programme
AOI	Area of Influence
CESMP	Contractors Environmental and Social Management Plan
CHPA	Central Housing and Planning Authority
ECG	Erosion Control Guidelines
EHS	Environment, Health and Safety
EPA	Environmental Protection Agency
ERP	Emergency Response Plan
ESA	Environmental and Social Assessment
ESMF	Environmental and Social Management Framework
ESPF	Environmental and Social Policy Framework
ESMP	Environmental and Social Management Plan
EHSMP	Environmental, Health and Safety Monitoring Plan
GD	Georgetown Datum
GoG	Government of Guyana
GPL	Guyana Power and Light Company
GRM	Grievance Redress Mechanism
GTT	Guyana Telephone and Telegraph Company
GUYSUCO	Guyana Sugar Corporation
GWI	Guyana Water Inc.
HDPE	High Density Polyethylene
JRPC	Joined Reinforced Concrete Pavement
HMMP	Hazardous Materials Management Plan
HSE	Health, Safety and Environment
IDB	Inter-American Development Bank
ITCZ	Inter-Tropical Convergence Zone
IUCN	International Union for Conservation of Nature
LCDS	Low Carbon Development Strategy
LRP	Livelihood Restoration Plan
MH&W	Ministry of Housing and Water
MHDPRP	Multi-Hazard Disaster Preparedness and Response Plan

NDC	Neighbourhood Democratic Council
NDS	National Development Strategy
NEAP	National Environmental Action Plan
NIDRMP	National Integrated Disaster Risk Management Plan and Implementation Strategy
NLUP	National Land Use Plan
PAPs	Project Affected Parties
PEU	Project Execution Unit
RDC	Regional Democratic Council
SPCCP	Spill Prevention, Control and Countermeasures Plan
SDG	Sustainable Development Goals
SDMG	Soil and Drainage Management Guidelines
SR	Scoping Report
SN	Structural Number
TMP	Traffic Management Plan
TOR	Terms of Reference
WHO	World Health Organisation
WMP	Waste Management Plan
WSA	Women Safety Audit

EXECUTIVE SUMMARY

The Government of Guyana, with support from the Inter-American Development Bank (IDB) is currently implementing the Road Network Upgrade and Expansion Programme: Adequate Housing and Urban Accessibility Programme" or AHUAP. The programme is specifically aimed at improving the quality of life in urban and peri-urban Georgetown, through better access to adequate housing and basic infrastructure for low-income populations, enhance urban and suburban mobility and safety, and strengthen national and local capacity to operate and maintain urban services. The Ministry of Housing and Water, through the Central Housing and Planning Authority (CHPA), is tasked with the implementation of the AHUAP, which is designed as a multi-work programme. Component 1 of the Programme focuses on the delivery of quality housing and basic infrastructure solutions and includes three (3) sub-components: affordable and sustainable housing; consolidation of existing housing schemes; and implementation support and institutional strengthening. Under this Component the CHPA is pursuing a project to improve infrastructure within several communities along the East Bank Demerara, Region 4. For this project an Environmental and Social Assessment (ESA) was required to be performed.

The ESA aims at identifying potential environmental, social, health and safety risks associated with the implementation of the project, and developing recommendations to mitigate and manage such risks. The general objective of the ESA is to ensure that the potential environmental and social impacts of the activities of the proposed project interventions are identified, evaluated and addressed as part of the project's design phase for the project site, and further improve integration of project interventions into their environmental and social setting, and mitigate negative environmental and social impacts.

The project consists of five categories of infrastructure construction and rehabilitation works which spans across six adjoining communities within the East Bank Demerera area. These communities are Peter's Hall, Providence (Phase Two North and South), Perseverance, Herstelling, Farm (Phases One and Two) and Covent Garden. The five categories of work include road rehabilitation, cleaning and improvement of drains, construction of reinforced concrete sidewalks, construction of culverts, and installation of solar street lights. The project will be divided in various lots to be awarded to different contractors through a tendering process.

The project area has a long history of use by agriculture, being occupied by the sugar plantations for over two centuries. The area was converted to housing lands when the Guyana Sugar Corporation (GUYSUCO) discontinued sugar cultivation on the Demerara estates as part of the Government's policy to downsize the industry. Currently, housing occupies most of the area as part of a planned housing development. Most of the utilities and infrastructure required for housing development are in place.

The project activities are expected to comply with all national policies and plans, legislation and guidelines, especially those relating to the environment, health and safety. The project will also have to comply with the IDB Safeguard Policies relevant to the project. The CHPA will have direct oversight of the project and has an Environmental Unit within the Projects Department which will ensure environmental compliance. The Environmental Protection Agency is also expected to play a role in ensuring environmental compliance. The contractors will be required to have as part of their project team an Environmental Personnel who will be required to ensure the environmental measures set out in the Environmental and Social Plan (ESMP) are implemented.

During the ESA preparation process stakeholders' engagements were conducted, including central and local levels stakeholders. The general feedback is that the communities are in support of the project and are eager to have the project completed soonest. It was noted that the rehabilitation of the roads, construction of drains, and installation of street lights in some areas will have a number of advantages such as improved access, less vehicle damage, proper drainage, increase the property value, encourage other land owners to build and move into the community, and aid in other business ventures. Stakeholders are hopeful that the rehabilitation of the road may reduce flooding of the road and less holes with water making it easier for pedestrians, especially school children to use the road. Further, this improved access may enable other persons to own low-cost vehicles such as cars, since at present some cars cannot access the streets. This will help residents to be more efficient and independent. While residents acknowledge that there will be temporary negative impacts from the project such as dust and noise pollution, blocking of roads and other access points, and that they may be required to use an alternative access road, residents acknowledge that these are temporary and unavoidable impacts and that they are willing to be uncomfortable for a short period of time so that they can have better roads and other community facilities.

Most of the project impacts identified or envisaged will be localised and can be mitigated with the implementation of management and mitigative measures. These impacts are directly linked to the construction works and will likely to occur only around the areas of active construction works. The more significant potential impacts identified are:

- Dust nuisance
- Noise generation
- Surface water sedimentation/contamination
- Disruption of utilities
- Workers' health and safety
- Public safety

No impact to the biological environment is foreseen since the area is an already developed housing scheme. Most social impacts are positive since the project will result in enhancement of the community. Minor impacts on the community will include disruption to accesses to properties during construction, and possibly social impacts from the presence of construction workers within the communities.

An ESMP is prepared which recommends measures to be implemented by CHPA and the contractors to ensure any potential negative impacts are managed, prevented or minimised. Measures are included for the mitigation of the following:

- Dust and noise suppression
- Protection of water quality
- Collection and disposal of waste to be generated
- Handling and storage of fuel and other hazardous materials
- Measures to address the disruption of utilities and services
- Health and safety measures for workers
- Measures to ensure the safety of the public
- Conduct of project workers

The measures outlined in the ESMP are to be communicated early in the process to the contractors so these can be addressed prior and during construction. The contractors should prepare

Construction Environmental and Social Management Plans (C-ESMPs) and be required to provide the necessary awareness to workers to ensure they are aware of their responsibilities in ensuring compliance. Training should also be provided to workers including a Heath, Safety and Environmental Induction Training, and specific training in the C-ESMP, Code of Conduct for Workers, and in Emergency Response. Contractors should also have as part of their team a health, safety and environmental personnel. The work sites are to be monitored for non-compliances and corrective actions are to be addressed promptly. Environmental monitoring will also have to be done by the contractors, including the monitoring of air quality, noise levels, and water quality. The contractors will also be required to implement an Emergency Response Plan.

Prior and during project implementation it is recommended that the community be kept informed on the project and the progress of works. As such, a Stakeholder Engagement Plan is included as part of the management framework for the project. In addition, a Grievance Redress Mechanism is also included so as to enable any anyone who may have an issue with the project or project related activities to have it addressed in an understandable, transparent and fair process.

Overall, the potential negative impacts of the project are few, which are very localised, and can be prevented or minimised effectively once the measures outlined in the ESMP are implemented. There will be significant positive impacts once the project is implemented, especially as it relates to improving the well-being of the residents of the communities.

1.0 INTRODUCTION

1.1 Background

The Government of Guyana (GoG), in May of 2017, renegotiated with the Inter-American Development Bank (IDB) to reformulate a 2012 loan operation "Road Network Upgrade and Expansion Program" (GY-L1031) to include a component addressing housing and basic infrastructure needs of low-income populations in social housing schemes in the Greater Georgetown area. This initiative gave rise to the reformulated Road Network Upgrade and Expansion Programme labelled "LO-1031 BL/GY: Adequate Housing and Urban Accessibility Programme" or AHUAP. The programme is specifically aimed at improving the quality of life in urban and peri-urban Georgetown, through better access to adequate housing and basic infrastructure for low-income populations, enhance urban and suburban mobility and safety, and strengthen national and local capacity to operate and maintain urban services. The Ministry of Housing and Water (MH&W), through the Central Housing and Planning Authority (CHPA), is tasked with the implementation of the AHUAP, which is designed as a multi-work programme.

Due to the nature of the Programme, it was categorised by the IDB as a Category B Programme. This means that negative environmental and social impacts of the Programme activities are likely to be mostly local and short-term, and can be readily mitigated with effective mitigation measures. Based on this categorization, IDB Operational Policy 703 - Directives B.2, B.3, B.4, B.5, B.6, B.7, B.10, B.11, B.17 and OP 761 and the Programme's Amendatory Loan Agreement, Environmental Social Management Framework (ESMF) and Operating Regulations requires that an Environmental and Social Assessment (ESA) for each project site be performed, with the development of an Environmental and Social Management Plan (ESMP) to identify and manage environmental, social, health and safety risks and impacts. Further, the reformulated program requires the development of the ESA to support approval of the reformulation.

The project falls under a multi-works programme and all new projects have to follow the environmental and social guidelines and procedures from the ESMF. This ESA/ESMP ensures that the project complies with these requirements.

Component 1 of the Programme focuses on the delivery of quality housing and basic infrastructure solutions and includes three (3) sub-components: affordable and sustainable housing; consolidation of existing housing schemes; and implementation support and institutional strengthening. Under this Component the CHPA is pursuing a project to improve infrastructure within selected communities along the East Bank Demerara, Region 4. For this project an ESA is required to be performed. In this regard, the CHPA has procured the services of a Consultant to undertake the ESA for project. This document presents the ESA for the project.

1.2 Purpose and Objectives of the ESA Study

The ESA aims at identifying potential environmental, social, health and safety risks associated with the implementation of the project, and developing recommendations to mitigate and manage such risks. The general objective of the ESA is to ensure that the potential environmental and social impacts of the activities of the proposed project interventions are identified, evaluated and addressed as part of the project's design phase for the project sites, and further improve integration of project interventions into their environmental and social setting, and mitigate negative environmental and social impacts. The specific objectives of the ESA are:

1. To understand the existing environmental and social conditions within the project area; and

2. To identify the potential social and environmental impacts of the proposed project interventions.

As such, the ESA focused primarily on the implementation of all infrastructure works related to the project and identified the potential impacts of the activities on the physical, biological and socio-economic environment, and outlined mitigation measures to prevent and reduce these impacts. In addition, many of the activities of the project would involve elements of health and safety were also addressed and integrated, as far as is necessary, with the prescriptions for environmental and social management. The ESA covered a geographical location comprising the following communities along the East Bank Demerara:

1. Peter's Hall
2. Providence (Phase Two North and South)
3. Perseverance
4. Herstelling
5. Farm (Phases One and Two)
6. Covent Garden

1.3 Approach and Methodology

The ESA was prepared in accordance with the consultancy's Terms of Reference, which specifically requires the assessment to be conducted and a management plan prepared for all the infrastructure works, which will eventually form part of the Contractors' contract documents. In addition, the preparation of the ESA was guided by the project's ESMF. Further, the process was done in accordance with the Environmental Protection Agency (EPA) guidelines for the preparation of Environmental Assessment and Management Plans, and guided by the IDB's requirements, guidelines and safeguard policies which are applicable to the project or those triggered by the project.

Prior to the preparation of the ESA report, a Scoping Report was prepared as one of the key deliverables of the consultancy. The main purposes of the scoping study are to present a description of the project; review and evaluate the legislative and regulatory framework applicable to the program, including the IDB's requirements; preliminary identification and evaluation of key environmental and social-economic aspects of the select project site; and identifying and categorizing stakeholders. In addition, an Environmental and Social Checklist was completed. The preparation of the Scoping Report provided the basis for the ESA.

During the initial phase of the preparation of the ESA the following was done to gain an in depth understanding of the project and the project environment:

- Meeting with project officials from the CHPA to discuss the proposed project and collect project related information. Throughout the process several discussions were held with key personnel from the CHPA in order to ascertain a good understanding of the civil works to be undertaken, the project areas, and other activities as it relates to the general scope of work.

- Review all project related information to gain a clear understanding of the project and to determine the scope and magnitude of the works to be done. Some amount of existing data and literature relevant to the type of project and the project environment also exist and were therefore reviewed. These documents include:

    - The project's Environmental and Social Framework
    - The La Parfaite Harmonie project Environmental and Social Assessment
    - The project's Design Report
    - Relevant policies, legislations, standards and guidelines, etc.

- Conducted an initial visit to the project area to understand the project area and footprint. Site visits to the project site continued throughout the process to each community within the general project area. This was done so as to gain a better understanding of the project, the existing condition of the area and to assess the biological and social conditions. These visits were beneficial in determining the characteristics of the project environment, which in turn assisted in the categorisation of all physical, environmental and biological impacts. It is important to note that these visits were instrumental to the process since they allowed for critical ground-truthing, which provided useful information, and also validated information obtained from literature reviews.

- Determined the project's Area of Influence (AOI). The project's AOI is the footprint of the project interventions, and the communities within which the interventions will occur.

Once the above was completed a project description was compiled, outlining the project intervention and the areas to benefit from these interventions.

Thereafter, a review of the policy, legislative and institutional framework relevant to the project done. This includes an analysis of all pertinent environmental and social requirements that are applicable to the project, including a brief description of the permitting and licensing procedures, and the relevant policies and legislation. Applicable standards and their application are also discussed. The institutional framework relevant to the environmental and social aspects of the project are also identified. Information pertaining to the various requirements of the IDB and safeguard policies that were triggered by the project are also described and analysed.

Thereafter, the preparation of the ESA was done in three phases as follows:

1. Establishing the Baseline Conditions
2. Impact Determination
3. Environmental Management and Mitigation Planning.

<u>Establishing the Baseline Conditions</u>

This phase comprised the following:

1. A description of the project environment was compiled. This required the collection primary and secondary data on the physical, biological and socio-economic environment.

    - Primary data was collected as part of the field work at the project sites and include water quality analyses, noise measurement, air quality analysis, and a rapid

biodiversity assessment. It also included collection of socioeconomic data such as on land uses, population, etc. The methodology utilized for the collection of primary data is further described under the respective sections of Chapter 3.

- Secondary data was obtained from existing sources such as reports relating to the project area. This included weather data obtained by the Hydrometeorlogical Department and population data from the Bureau of Statistics.

2. Consultations with stakeholders was also done including with relevant institutions, communities' members, and other relevant personnel. Engagement with project stakeholders was conducted by the CHPA and the feedback from these engagements were shared with the Consultant and was considered as part of the ESA process. For the purpose of the ESA, and as part of the Scoping Report, stakeholders' identification and categorisation were done. Consultation was then done with the communities through interviews with community members who were considered the primary stakeholders. Secondary stakeholders were engaged by interviews via telephone. The feedback assisted in determining some of the potential social impacts of the project. The methodology utilized for the stakeholders' engagement as well as the feedback received are further described in Chapter 5.

Review of Data and Impact Analysis

Once the project and the project environment, along with the regulatory requirements and stakeholders' concerns were understood, the impact prediction and assessment were conducted. The potential environmental and social effects and impacts during the construction phase of the project were assessed utilising an impact assessment matrix. The matrix was used to predict the significance of the impacts by establishing the interactions between the proposed project activities and the characteristics of the existing environment and within the effective area of direct and indirect influence. The full range of potential impacts were examined using these qualitative assessments to identify and recommend appropriate and adequate mitigation and management measures.

The impact assessment was also guided by the Environmental and Social Screening Checklist provided by the CHPA (Annex 1). In keeping with the ToR, all potential impacts identified were categorised under the following categories:

- ***Physical Environment*** **–** this includes impacts pertaining to microclimate, air quality, water quality, noise levels, drainage, landscape and soil quality, and waste management.

- ***Biological Environment*** **–** this includes impacts pertaining to ecosystem and biodiversity (including rare, endangered and endemic biodiversity components), and biological resources of cultural, social, or economic importance.

- ***Socio-economic Environment*** **–** this includes impacts pertaining to aspects that depend on environmental changes such as but not limited to public health, vulnerability and access to natural resources, resettlement, potential loss of property/land acquisition, loss of agricultural land, loss of right of use, easement/access

arrangements, loss of income, property damages to nearby Project Affected Persons (PAPs), cultural heritage, and sites of historical, archaeological or cultural value.

Mitigation and Management Planning

Once the potential physical, biological and social impacts were known and understood, mitigation and management planning commenced. During this phase the following were done:

1. Feasible and practical measures were identified and recommended to reduce and mitigate the potential negative impacts or the project, as well as, maximise the expected positive impacts.

2. A Stakeholder Engagement Plan which should be applied during project implementation, especially as it relates to grievances, was prepared.

3. Measures for emergency response were recommended.

4. An implementation framework for the environmental and social management plan was prepared, outlining responsibilities, timeframe, etc.

5. A Monitoring Framework that examines the social and environmental parameters to be monitored during the construction phase was also prepared.

1.4 Organisation of the ESA

The ESA is outlined in a number of Chapters, as summarized below:

- **Executive Summary –** This presents a concise statement of the project objectives and a brief project description in addition to a description of key ESA findings and recommendations for environmental and social management.

- **Chapter 1: Introduction -** This chapter presents a background to the ESA, the scope and format of the document and methodology used to prepare the document.

- **Chapter 2: Project Description -** This chapter provides a description of the proposed project.

- **Chapter 3: Policy, Legal, Institutional and Regulatory Framework -** This chapter provides a summary of national policies relevant to the project, specific legislation and the regulatory bodies which will have oversight of the project's activities. It describes the relevant IDB policies that are applicable to the project.

- **Chapter 4: Environmental and Associated Social Conditions**- This chapter provides a description of the project environment, including the physical, biological and socio-economic environment.

- **Chapter 5: Public Consultations and Disclosure –** This chapter documents the findings of the stakeholders' consultations, including the interviews conducted with institutions and agencies and consultations with communities' members.

- **Chapter 6: Environmental and Social Impact Assessments -** This chapter assesses the potential impacts of the project on the physical, biological and socio-economic environments.

- **Chapter 7: Environmental and Social Management Plan -** This chapter outlines practical measures to prevent and manage potential adverse environmental impacts.

- **Chapter 8: Implementation Framework -** This chapter describes the recommended framework to be in place prior and during project implementation to ensure that the ESA is fully implemented and is effective, including monitoring and reporting, stakeholders' engagement and addressing of grievances.

- **Chapter 9: Public Disclosure –** This chapter describes the public disclosure process of the draft ESA.

2.0 PROJECT DESCRIPTION

2.1 Project Overview

As indicated, the GoG, in May of 2017, renegotiated with the IDB to reformulate a 2012 loan operation to include a component addressing housing and basic infrastructure needs of low-income populations, enhance urban and suburban mobility and safety, and strengthen national and local capacity to operate and maintain urban services in social housing schemes in the Greater Georgetown area. This initiative gave rise to the reformulated Road Network Upgrade and Expansion Programme labelled "LO-1031 BL/GY: Adequate Housing and Urban Accessibility Programme" or AHUAP. The programme is categorized as a 'multi-works loan', whereby potential sites for intervention must be located in CHPA Housing Areas and in urban and peri-urban Georgetown. The Ministry of Housing and Water, through the CHPA, is tasked with the implementation of the AHUAP.

Under Component 1 of the reformulated programme, the CHPA is tasked with the implementation of three (3) sub-components, which include the following:

1. **Affordable and Sustainable Housing:** The sub-component finances the delivery of subsidies to contribute to affordable housing solutions for low-income households in the Georgetown area and peri-urban areas, for: (i) housing improvement, and (ii) construction of core homes on existing serviced lots. This Component has a budget of USD 10 million.

2. **Consolidation of Existing Housing Schemes:** The sub-component, which follows a multiple works approach, finances completion or rehabilitation of infrastructure and services on housing sites in the Georgetown area and peri-urban areas. Specific investments is tailored to local conditions and include: (i) secondary road maintenance and rationalization; (ii) climate-ready drainage; (iii) installation of street lighting and relocation of utilities as needed; and (iv) community facilities development or upgrading on earmarked publicly-owned lands that will include gender considerations regarding access and use. This Component has a budget of USD 16 million.

3. **Implementation Support and Institutional Strengthening:** This sub-component will finance institutional strengthening activities for: (i) project management and monitor and evaluation for CHPA; and (ii) operations and maintenance training for Local Democratic Organs in charge of housing sites such as the Neighbourhood Democratic Councils. This Component has a budget of USD 1 million.

The ESA, however applies to the second aspect of Component 1, which is the consolidation of existing housing schemes. Under this Component the CHPA is pursuing a project to improve infrastructure within selected housing schemes along the East Bank of Demerara. This project will see the upgrading of infrastructure such as construction of roads, drainage, reinforced concrete sidewalks and culverts and the installation of solar street lighting in the following communities:

7. Peter's Hall
8. Providence (Phase Two North and South)
9. Perseverance
10. Herstelling
11. Farm (Phases One and Two)
12. Covent Garden

The following sub-section provides a more in-depth description of the project's scope of works.

2.2 Project Justification

According to the Project Profile prepared for the reformulation of the Roads Network, Upgrade and Expansion Program, over 90% of Guyana's 747,000 population lives on a coastal strip representing only 5% of total land. The capital, Georgetown is home to 310,000 people, many of whom reside in areas that are vulnerable to flooding and the impacts of climate change.[1] Large shelter deficits characterized by inadequate housing and supporting road and drainage infrastructure exacerbate this vulnerability. In addition, accessibility, particularly for low-income communities in per-urban areas to the south of Georgetown and east of the Demerara River, remains an issue. In fact, 26.64% of the population is estimated to be multi-dimensionally poor, higher than the regional average of 18.04%.[2]

In Georgetown, poverty is evident in various measures of the standard of living and housing deficits. 29% of the population live in overcrowded housing (over two people per room).[3] Criminality in Georgetown is also high, with 33.8 murders per 100,000 people, above the regional average of 26, perceived to be exacerbated by the lack of community facilities and public spaces. Basic infrastructure in new and established housing sites is developed 'incrementally' by CHPA: programs enable housing construction and extension through infrastructure upgrading and provision of formal title and land. This approach was supported through two positively-evaluated IDB operations, the Low-Income Settlement Programs (LISP) I and 11. However, despite the gains made, an estimated 249.5 km of roads and associated drainage still need to be completed to improve the living conditions of over 32,000 households, according to CHPA. Census data show that these deficits also occur in non-CHPA villages such as Durban Area, Industrial State, and East La Penitence, all located near the Sheriff-Mandela area. Finally, maintenance of public infrastructure in incremental housing sites is the responsibility of the local Neighbourhood Democratic Councils, which lack sufficient institutional capacity for long-term site management.

Moreover, Georgetown faces limited road infrastructure combined with a rapidly-growing fleet (100,000 new registered vehicles over the last decade) that contributes to congestion and accidents. These challenges affect low-income populations within the service area of Sheriff-Mandela area. Issues include the road's two-lane configuration, pavement width (9-12m, of which 80% is in fair to poor condition), traffic levels (peak 1500 Vehicles per Hour on a road with capacity for 1,320); and no provisions for non-motorized (pedestrian, bicycle) traffic.

The general objective of the Project is therefore to improve the quality of life in urban and peri-urban Georgetown through better access to adequate housing and basic infrastructure for low-income populations, and through improved accessibility and mobility services. The specific objectives include: (i) improve housing conditions and access to basic infrastructure for low-income communities; (ii) enhance urban and suburban mobility and safety; and (iii) strengthen national and local capacity to operate and maintain urban services.

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[1] 2012 Census, Bureau of Statistics

[2] 2015 Human Development Report, cited in the Guyana Country Development Challenges, 2016, IDB. Reference Information (RF) [11.

[3] 2012 Census, Bureau of Statistics

The Program is consistent with the update to the IDB's Institutional Strategy for 2010-2020 (GN-2788-5) as it seeks to address challenges of productivity and innovation, climate change and environmental sustainability, and social exclusion and inequality. The Program is aligned with the crosscutting themes of climate change and environmental sustainability as the proposed intervention will include climate-ready infrastructure designs. It focuses on an area for continued strategic dialogue with Guyana which is to improve urban transportation from the IDB Country Strategy with the Cooperative Republic of Guyana: 2012-2016 (GN-2690). It is also aligned with the Sector Framework Documents for both Urban Development and Housing (GN-2732) and Transport (GN-2740-3), as well as with the Strategy for Sustainable Infrastructure for Competitiveness and Inclusive Growth (GN-271 0-5), as it respectively seeks to provide a more inclusive urban setting (social exclusion and inequality reduction pillar) and support the efforts of the authorities to adapt to the effects of climate change; it contributes towards the consolidation of improvements to infrastructure systems and to the development of accessible, efficient, and safe urban transportation systems.

2.3 Scope of Works

Accordance to the Design Report prepared for infrastructure upgrade for selected housing schemes along the East Bank of Demerara, the project consists of five categories of infrastructure construction and rehabilitation works which spans across the six selected CHPA housing schemes along the East Bank of Demerara area, Region 4. Also, as indicated, the five categories of work include road rehabilitation, cleaning and improvement of drains, construction of reinforced concrete sidewalks, construction of culverts, and installation of solar street lights. Details of these works are presented below.

2.3.1 Rehabilitation of Roads

A total length of 7,377 meters (7.377 km) of roads are air marked for rehabilitation works under the project. These roads include both primary and secondary roads and are sparsely distributed among the six (6) communities. These roads were all selected based on a conditional survey that was conducted by the CHPA and were all identified as being critical. Details of the road rehabilitation works can be observed in Table 2-1 below.

Table 2-1: Distribution of Road Rehabilitation Works

Areas	Road Identification	Road Length (Meters)	Total Length Per Area (Meters)
PETERS HALL	PH6	437	**819**
	PH9	382	
PERSEVERANCE	P13	88	**88**
PROVIDENCE PHASE 2 NORTH	PVN4a	266	**1309**
	PVN23	265	
	PVN25	553	
	PVN27	225	

PROVIDENCE PHASE 2 SOUTH	PV18	388	**388**
HERSTELLING	HPC10	899	**899**
FARM PHASE 1&2	F24	292	**1410**
	F26	835	
	F27A	283	
COVENT GARDEN	CG4	462	**2464**
	CG21	278	
	CG23	194	
	CG26	200	
	CG27	355	
	CG35	395	
	CG36	580	
Total Length (Meters)			**7377**

Recommended Design Options

According to the design report, several design options were recommended for the various types of roads within the project areas. These design options are as follow:

Link Roads

Two options exist for these kinds for roads. Option 1 is an asphaltic concrete on crusher run road whereby the design layers relate to an actual Structural Number (SN) of 3.87 that is greater than the required SN of 3.78. Details of this design can be observed in Table 2-2 below. A cross section of this type of road is presented in Figure 2-1.

Table 2-2: Design for Asphaltic Concrete on Crusher Run (Option 1)

Courses	Material	Structural Coefficient	Drainage Coefficient	Thickness (inches)	Structural Number
Surface	Asphaltic Concrete	0.44	1	2	0.88
Base Course	Crusher Run	0.14	1	5	0.7
Sub-base Course 1	White Sand/Sand Clay	0.1	0.8	5	0.4
Existing Sub-base Course 1	White Sand/Sand Clay	0.1	0.8	6	0.48
Existing Sub-base Course 2	White Sand	0.08	0.8	22	1.41
TOTAL		**40**		**3.87**	

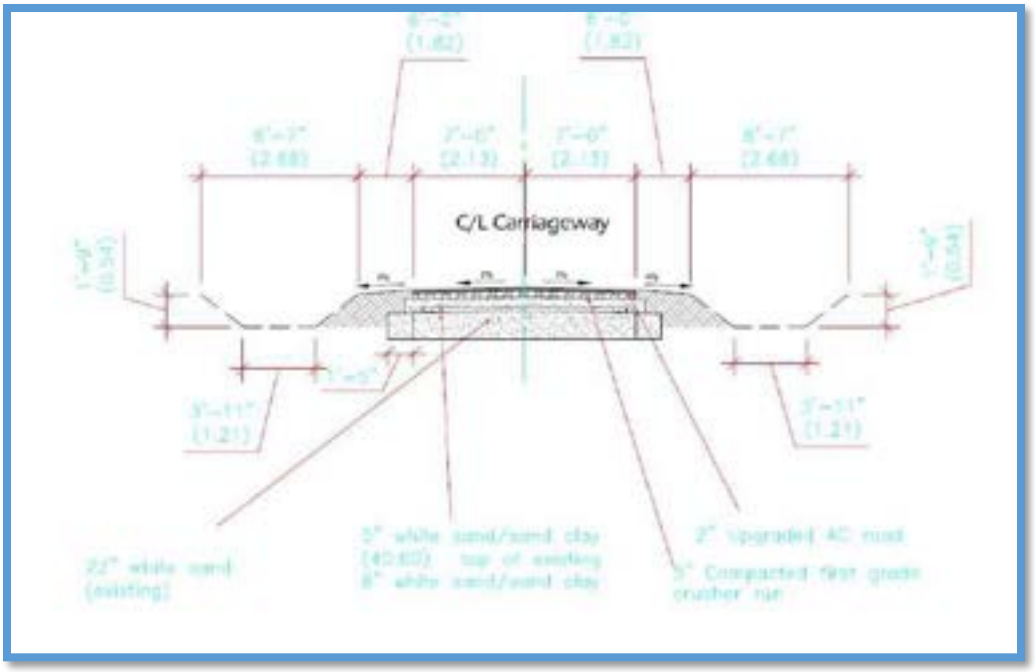


Figure 2-1: Cross Section of an Asphaltic Concrete on Crusher Run Link Road

The second option for this type of roads is a joined reinforced concrete pavement (JRCP) on white sand. The design details for this type of road can be observed in Table 2-3 below. A cross section of this type of road is presented in Figure 2-2.

Table 2-3: Design Details for Jointed Reinforced Concrete Pavement on White Sand (Option 2)

Courses	Material	Thickness (inches)
Surface	Jointed Reinforced Concrete Pavement	7
Sub-base	White Sand	12

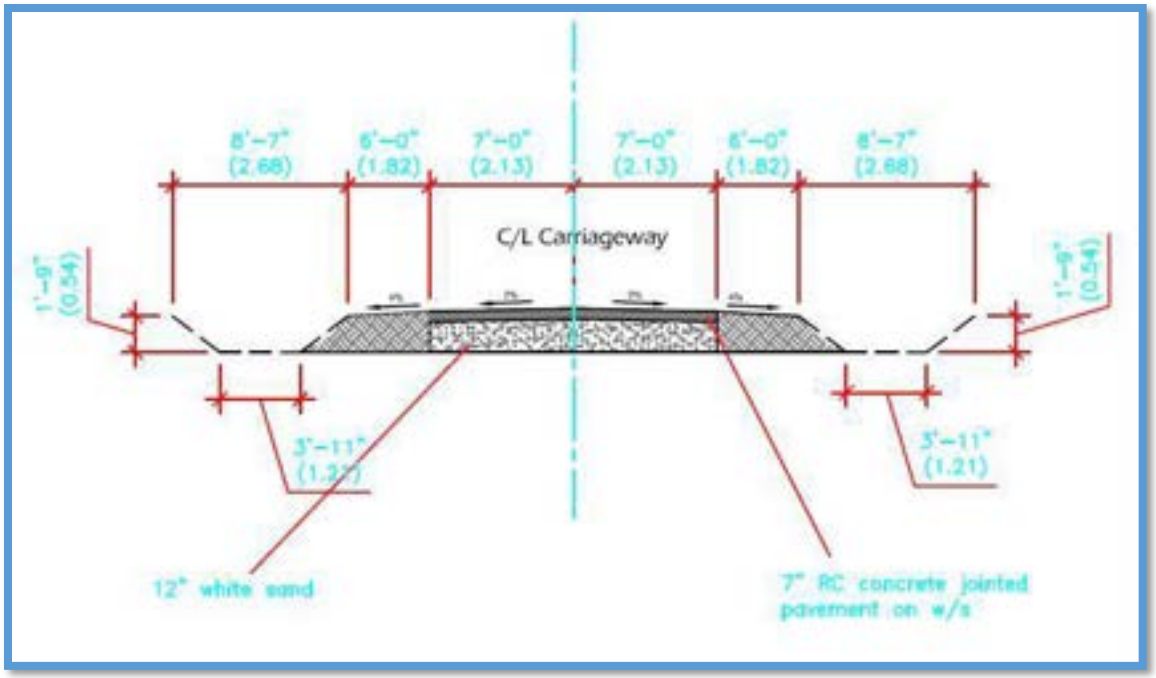


Figure 2-2: Cross Section of Jointed Reinforced Concrete Pavement on White Sand Link Road

Secondary Roads

Similarly, two options exist for secondary roads. Option 1 is an asphaltic concrete on crusher run road where the design layers relate to an actual SN of 3.73 which is also greater than the design SN of 3.53. Details of this design is presented in Table 2-4 below. A cross section of this type of road can be observed in Figure 2-3.

Table 2-4: Design Details for Asphaltic Concrete on Crusher Run (Option 1)

Courses	Material	Structural Coefficient	Drainage Coefficient	Thickness (inches)	Structural Number
Surface	Asphaltic Concrete	0.44	1	2	0.88
Base Course	Crusher Run	0.14	1	4	0.56
Sub-base Course 1	White Sand/Sand Clay	0.1	0.8	5	0.4
Existing Sub-base Course 1	White Sand/Sand Clay	0.1	0.8	6	0.48
Sub-base Course 2	White Sand	0.08	0.8	22	1.41
TOTAL		**39**		**3.73**	

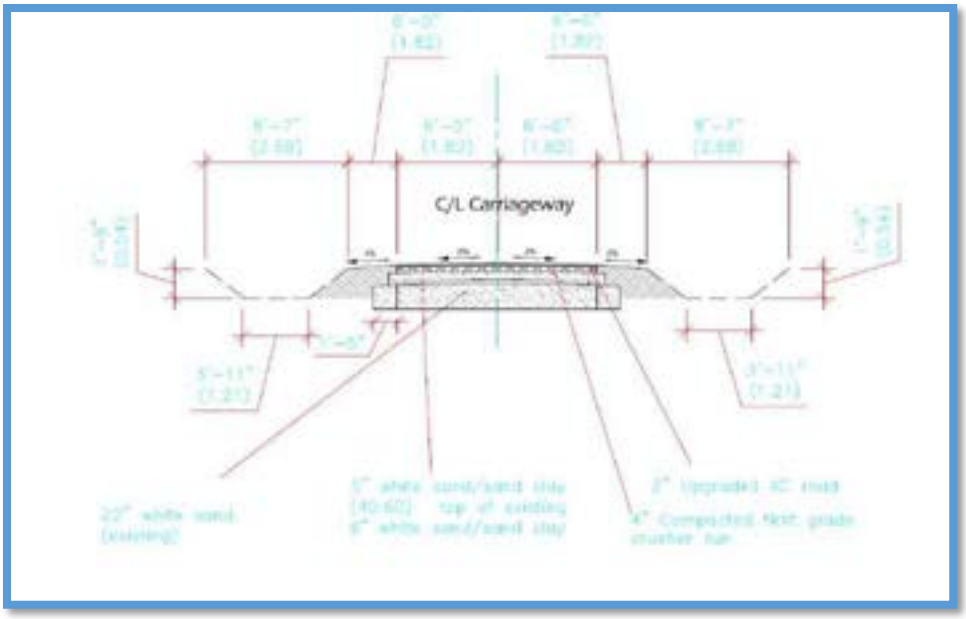


Figure 2-3: Cross section of an Asphaltic Concrete on Crusher Run Secondary Road

The second option for secondary roads is also a JRCP on white sand. The design details for this type of road is presented in Table 2-5. A cross section of this type of road can be observed in Figure 2-4.

Table 2-5: Design Details for Jointed Reinforced Concrete Pavement on White Sand (Option 2)

Courses	Material	Thickness (inches)
Surface	Jointed Reinforced Concrete Pavement	6.5
Sub-base	White Sand	12

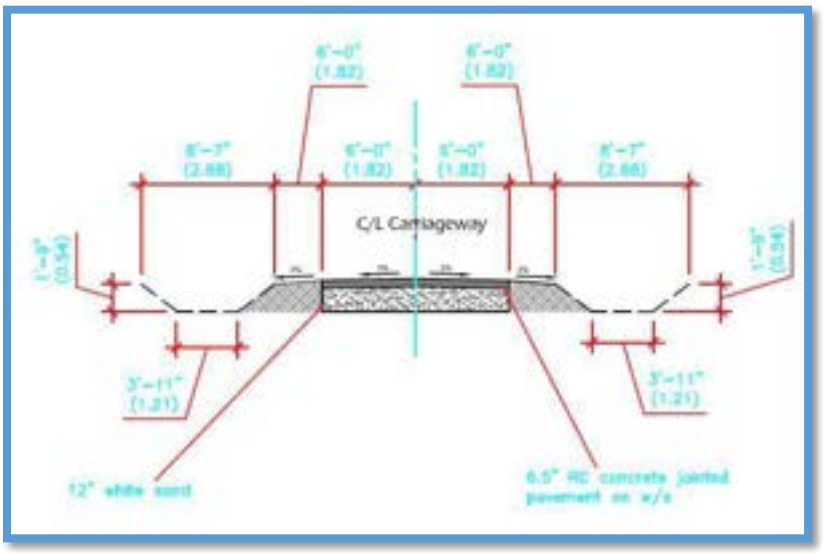


Figure 2-4: Jointed Reinforced Concrete Pavement on White Sand Secondary Road

In addition to these design options, there is the design for asphaltic concrete on existing run roads, whereby the design pavement layers relate to an actual SN of 3.99 that is greater than the design SN of 3.78. The design details for this type of road is presented in Table 2-6.

Table 2-6: Asphaltic Concrete on Existing Crusher Run Road

Courses	Material	Structural Coefficient	Drainage Coefficient	Thickness (inches)	Structural Number
Surface	Asphaltic Concrete	0.44	1	2	0.88
Base Course 1	Crusher Run	0.14	1	2	0.28
Existing Base Course 1	Crusher Run	0.14	1	3	0.42
Existing Sub-base Course 1	White Sand/Sand Clay	0.1	1	10	1.0
Existing Sub-base Course 2	White Sand	0.08	0.8	22	1.41
TOTAL		**39**		**3.99**	

All structural road designs will be done in accordance to the AASHTO—Geometric Design of Highways and Streets (2002). The following geometrics design will be used to construct the roads:

- **Width of Carriageway, Shoulder and Turning Radius -** The proposed upgraded carriageway widths will be the same as the respective existing road widths, which vary from 3.1m to 6.0m, with 3.66m width being predominant. A standard shoulder width of 1.52 m on both sides of the carriageway will be used and the turning radius is set at 9m.

- **Number of Lanes -** Two travel lanes will be used which would be sufficient to accommodate the traffic for the various areas.

- **Cross Slopes -** Pavement cross slope will be adequate to provide proper drainage. Normally, cross slopes range from 1.5 to 2 percent for high-type pavements and 2 to 6 percent for low-type pavements. High-type pavements are those that retain smooth riding qualities and good non-skid properties in all-weather with little maintenance. Low-type pavements are those with treated earth surfaces and those with loose aggregate surfaces. A 3 percent cross slope is desirable for low-type pavements. The paved carriageway will have a cross slope of 2% and the shoulders and verge will have a cross slope of approximately 4%.

- **Design Speed -** The design speed was selected as appropriate for environmental and terrain conditions and the various design features of the roadway, such as carriageway width, etc. The design speed for the roads is 50 km/hr.

- **Alignment and Finish Road Level -** The sites are predominantly flat and the vertical alignment of the roadways was based on the existing site topography and levels of the access roads outside of the sites.

Design Opted

The fact that all of the roads that were selected for rehabilitation intervention are secondary roads, the design opted is Option 1, which is that of Asphaltic Concrete on Crusher Run.

2.3.2 Cleaning and Improvement of Drains

With regards to the cleaning and improvement of drains, all existing earthen drains along both sides of the roads selected for rehabilitation intervention will be excavated/cleaned so as to re-establish the gradient and flow direction. All excavated spoils will be loaded onto trucks and taken to the Haags Bosch Landfill Site at Eccles for disposal. Materials that can be reused will be used for the construction of the road shoulders. Figures 2-5 to 2-10 show the typical drain cross sections of the existing and proposed designs for earthen drains in the various communities selected for intervention works.

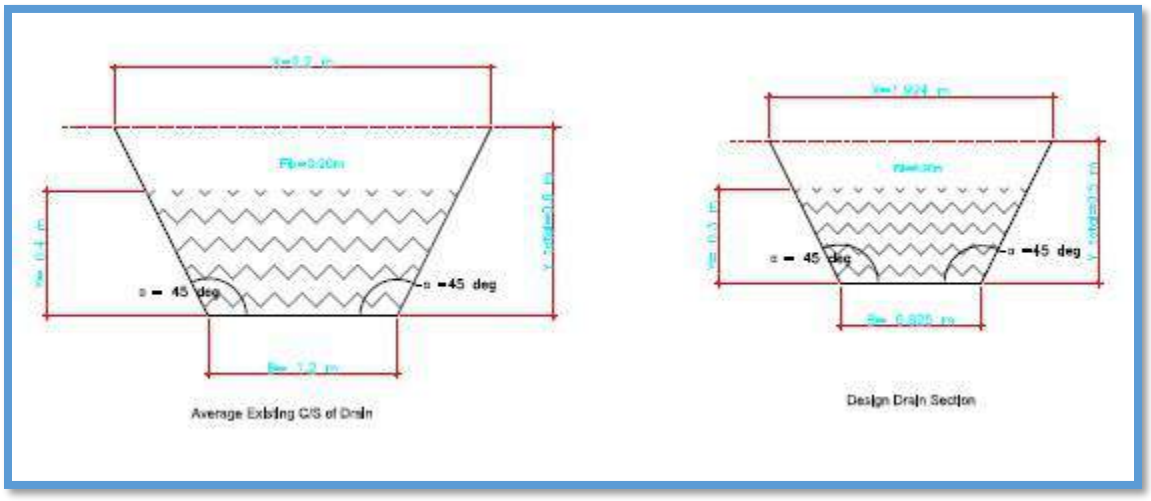


Figure 2-5: Typical Drain Cross Section for Peters Hall Roadside Earthen Drains

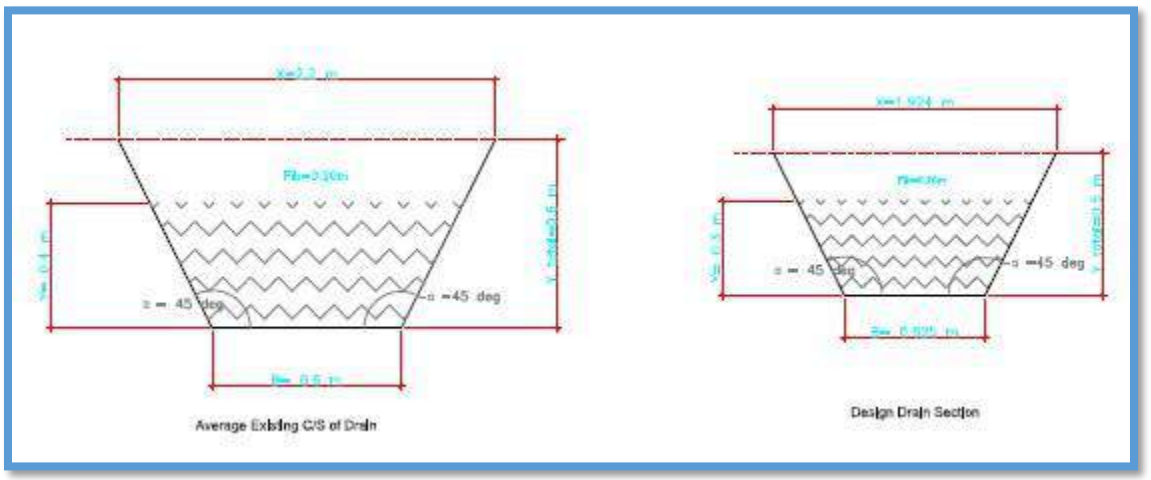


Figure 2-6: Typical Drain Cross Section for Perseverance Roadside Earthen Drains

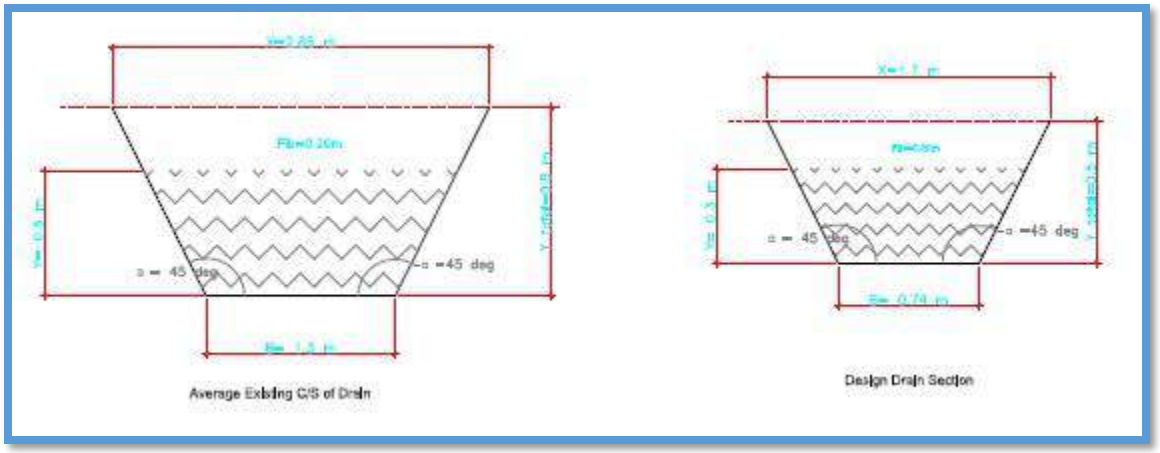


Figure 2-7: Typical Drain Cross Section for Providence Roadside Earthen Drains

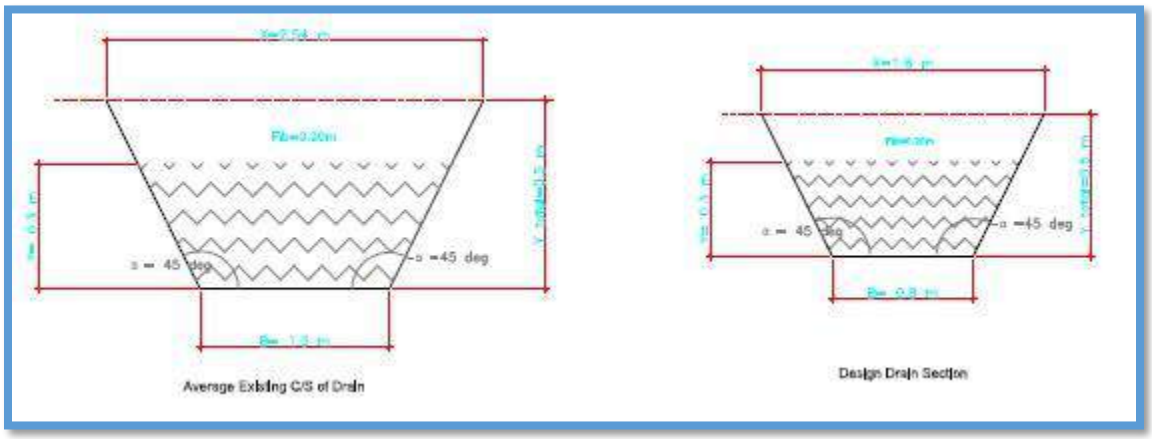


Figure 2-8: Typical Drain Cross Section for Farm Roadside Earthen Drains

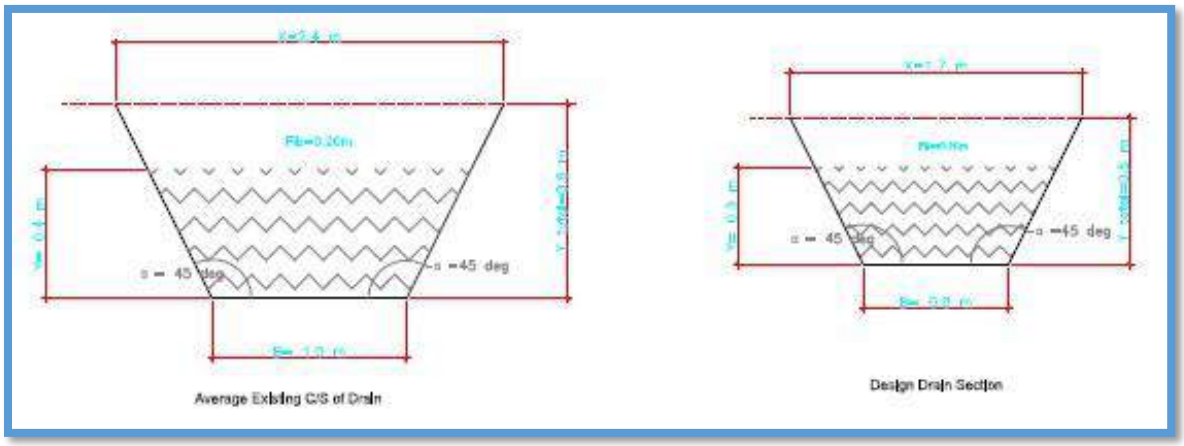


Figure 2-9: Typical Drain Cross Section for Perseverance Roadside Earthen Drains

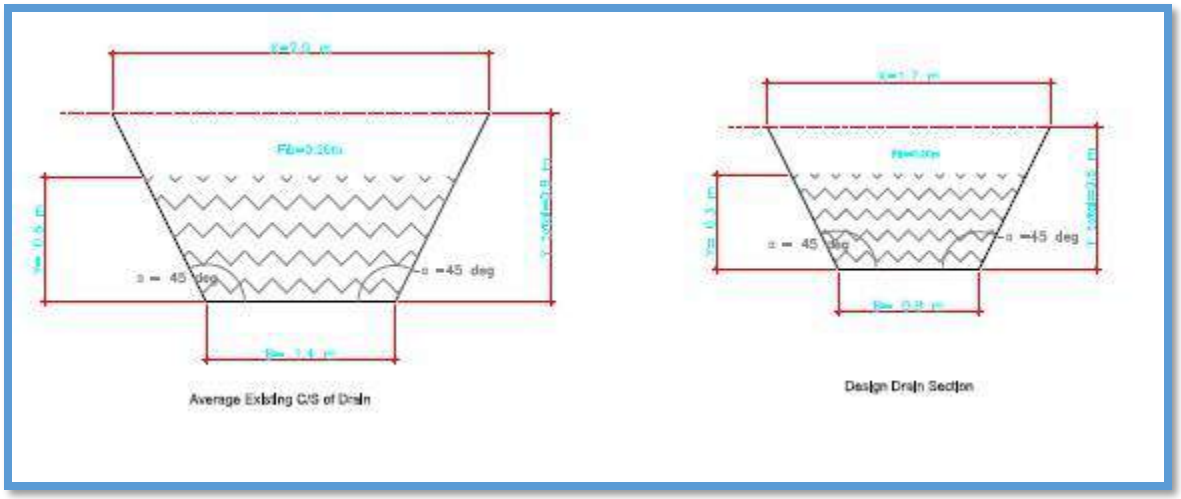


Figure 2-10: Typical Drain Cross Section for Covent Garden Roadside Earthen Drains

Areas where sidewalks will be constructed will be accompanied by the installation of reinforced concrete drains. These drains will be 3 feet wide with a depth of 3 feet. Table 2-7 shows the length of reinforced concrete drains to be constructed according to each community. Figure 2-11 shows a typical cross section of reinforced concrete drain.

Table 2-7: Length of Reinforced Concrete Drains to be Constructed according to Community

Lots	Location	Construction of RC Drains and Sidewalk
1	Peter's Hall	162 m
2	Providence (Phase 2 [North])	532 m
3	Providence (Phase 2 [South])	214 m
4	Perseverance	76 m
5	Herstelling	230 m
6	Farm (Phases 1 and 2)	538 m
7	Covent Garden	291 m
TOTAL		**2043 m (2 km)**

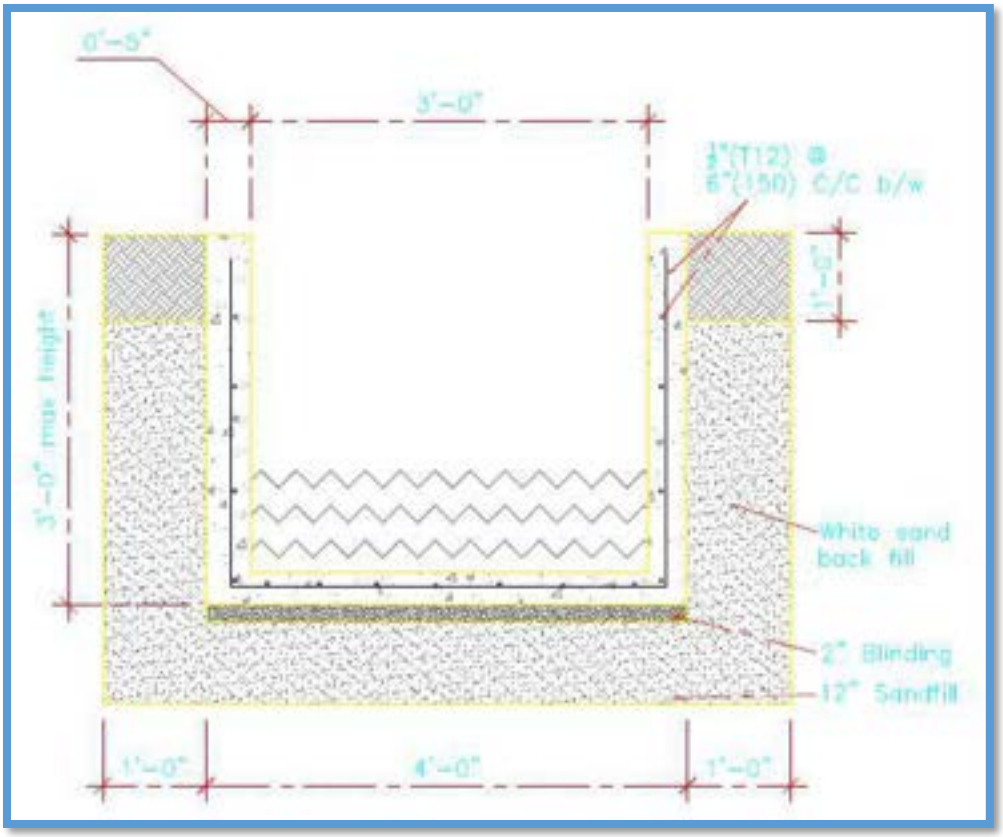


Figure 2-11: Typical Cross Section of the Reinforce Concrete Drains

2.3.3 Paved Sidewalks

A total of 2,043 meters of sidewalks are to be constructed on roads providing direct access to civic infrastructure such as schools, playgrounds, health centers and religious houses of worship. The sidewalks will be located on one side of the access road due to space constraints. Walkways will have minimum width of 1.5m (5 feet) so as to satisfy AASHTO minimum criteria for sidewalks located in local/urban roadways. The surface of the sidewalk will be so graded to allow for surface drainage of the roadway and sidewalk.

It is anticipated that there may be some wheelchair bound users of the sidewalk in the various schemes. In order to facilitate these users, on and off ramps will be incorporated into the sidewalk design. Additionally, street lights will be installed to enhance visibility at nights.
Sidewalks are designed as a continuous reinforced strip to withstand traffic loading since there is no separation from the roadway.

Table 2-8 provides a breakdown of the distribution of sidewalks within the communities selected for intervention. A cross sectional representation of these sidewalks is provided in Figure 2-12.

Table 2-8: Streets where Sidewalks will be Constructed and Proposed Length of Sidewalks

Areas	Street Identification	Length (Meters)	Total Length Per Area (Meters)
PETERS HALL	PH6	162	**162**
PERSEVERANCE	P13	76	**76**
PROVIDENCE PHASE 2 NORTH	PVN23	184	**532**
	PVN25	123	
	PVN27	225	
PROVIDENCE PHASE 2 SOUTH	PV17	214	**214**
HERSTELLING	HPC10	230	**230**
FARM PHASE 1&2	F24	286	**538**
	F50	126	
	F59	126	
COVENT GARDEN	CG4	85	**291**
	CG27	206	
Total Length (Meters)			**2043**

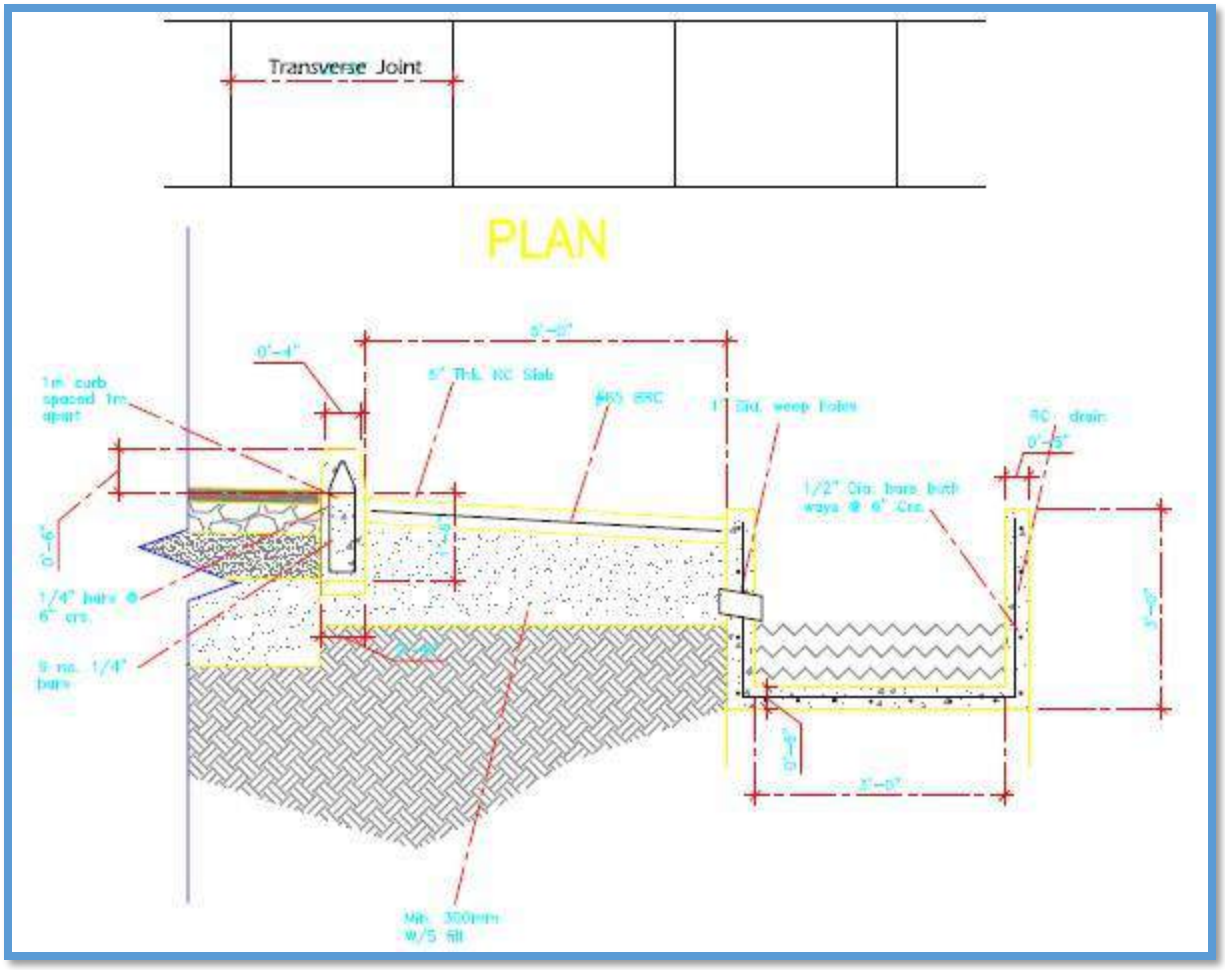


Figure 2-12: Cross Section of the Sidewalk and Reinforced Concrete Drain

2.3.4 Reinforced Concrete Culverts

A total of six single barrel High Density Polyethylene (HDPE) culverts (600mm) will be constructed, one in Providence Phase 2 North, one in Providence Phase 2 South, three in Farm Phases 1 and 2 and one in Covent Garden.

2.3.5 Street Lighting

Street lighting will be provided through the use of integrated solar/battery/LED light fixtures to provide illumination along streets which provide access to civic infrastructure. The aim is to provide adequate illumination to enhance road safety and security to persons traversing to and from the facilities. The choice of integrated solar fixtures was made to eliminate the burden and cost on the utility supply and is in keeping with the Government's Low Carbon Development Strategy.

2.4 Project Location

Geographically, the project spans several communities along the East Bank Demerera area between Peter's Hall to Covent Garden, as shown in Figure 2-13. These communities include Peters Hall,

Providence (Phase Two North and South), Perseverance, Herstelling, Farm (Phase One and Two) and Covent Garden. However, the works that are to be undertaken are sparsely dispersed between these six communities. Figure 2-14 to 2-18 provides the locations of all intervention works according to each selected community.

Figure 2-13: Location of the Project Area

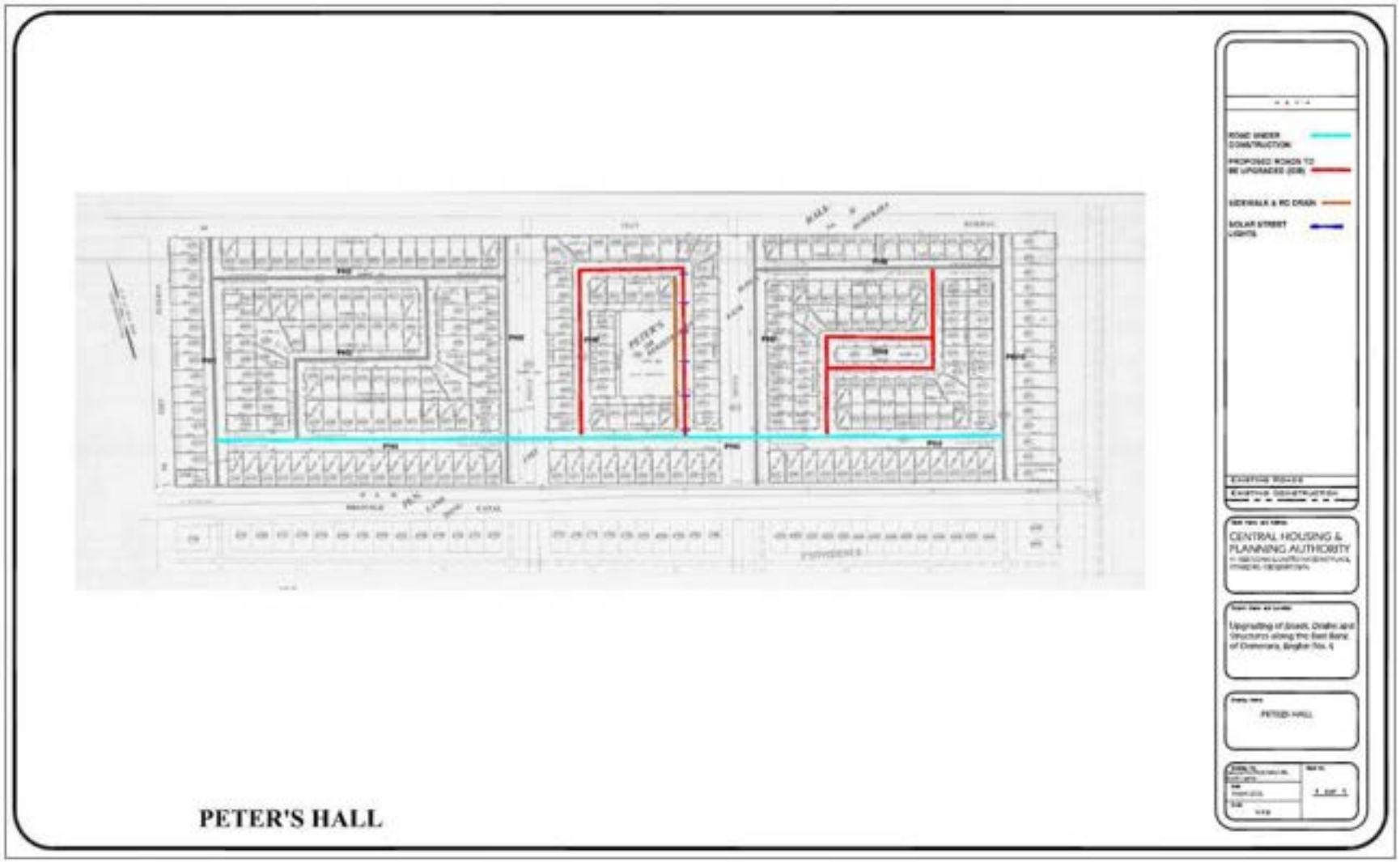


Figure 2-13: Location of Project Intervention Works in Peters Hall

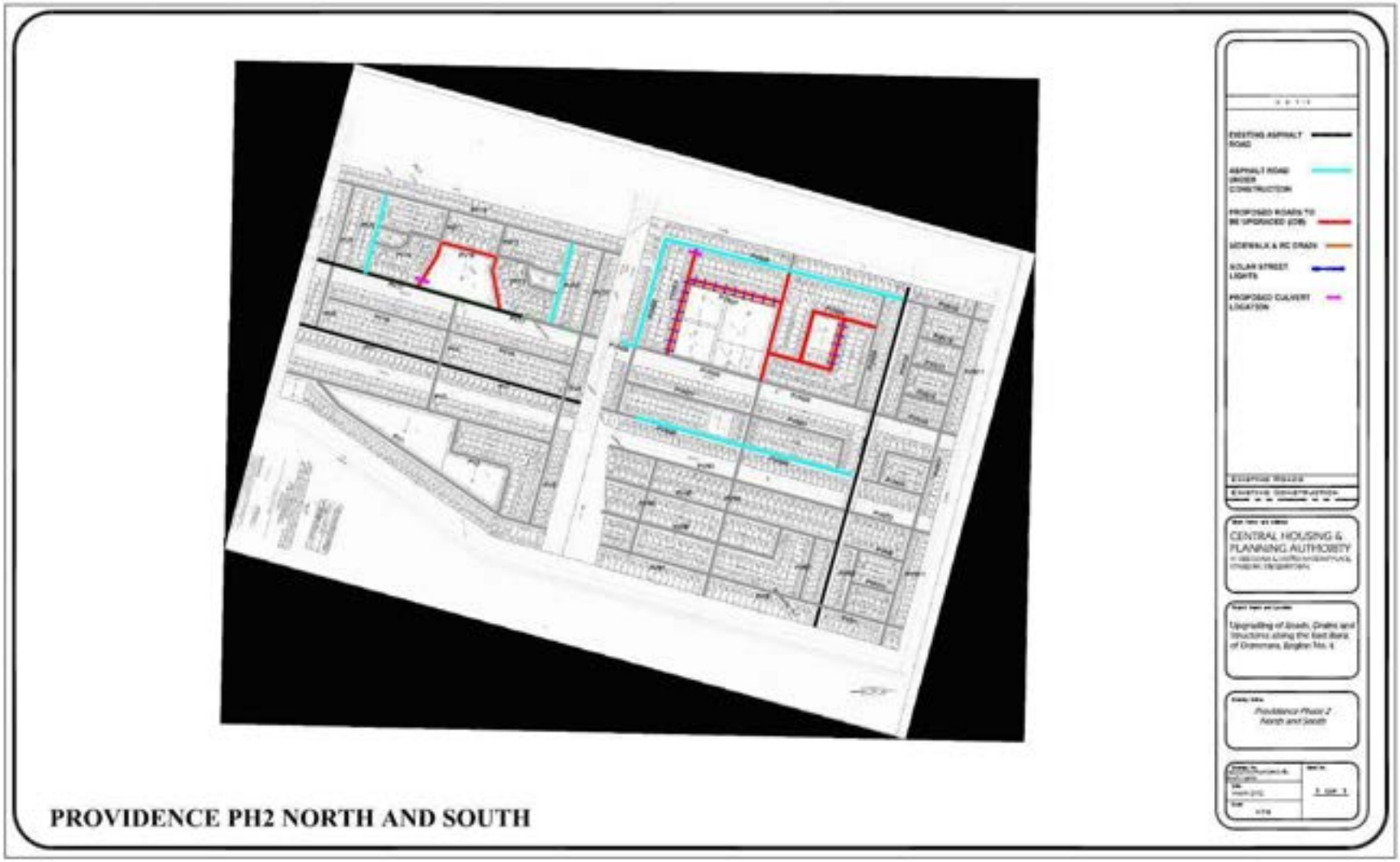


Figure 2-14: Location of Project Intervention Works in Providence Phase 2 North and South

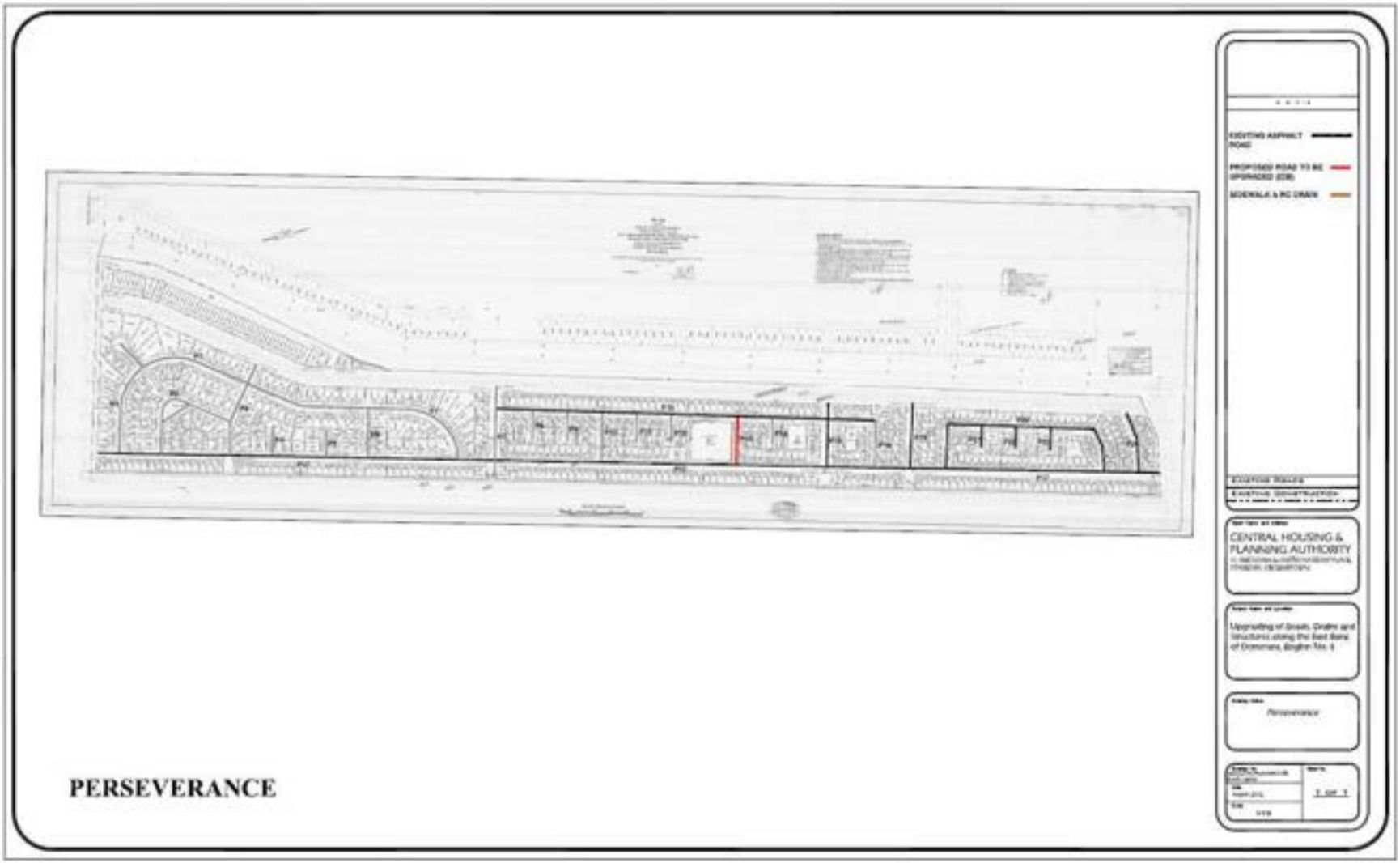


Figure 2-15: Location of Project Intervention Works in Perseverance

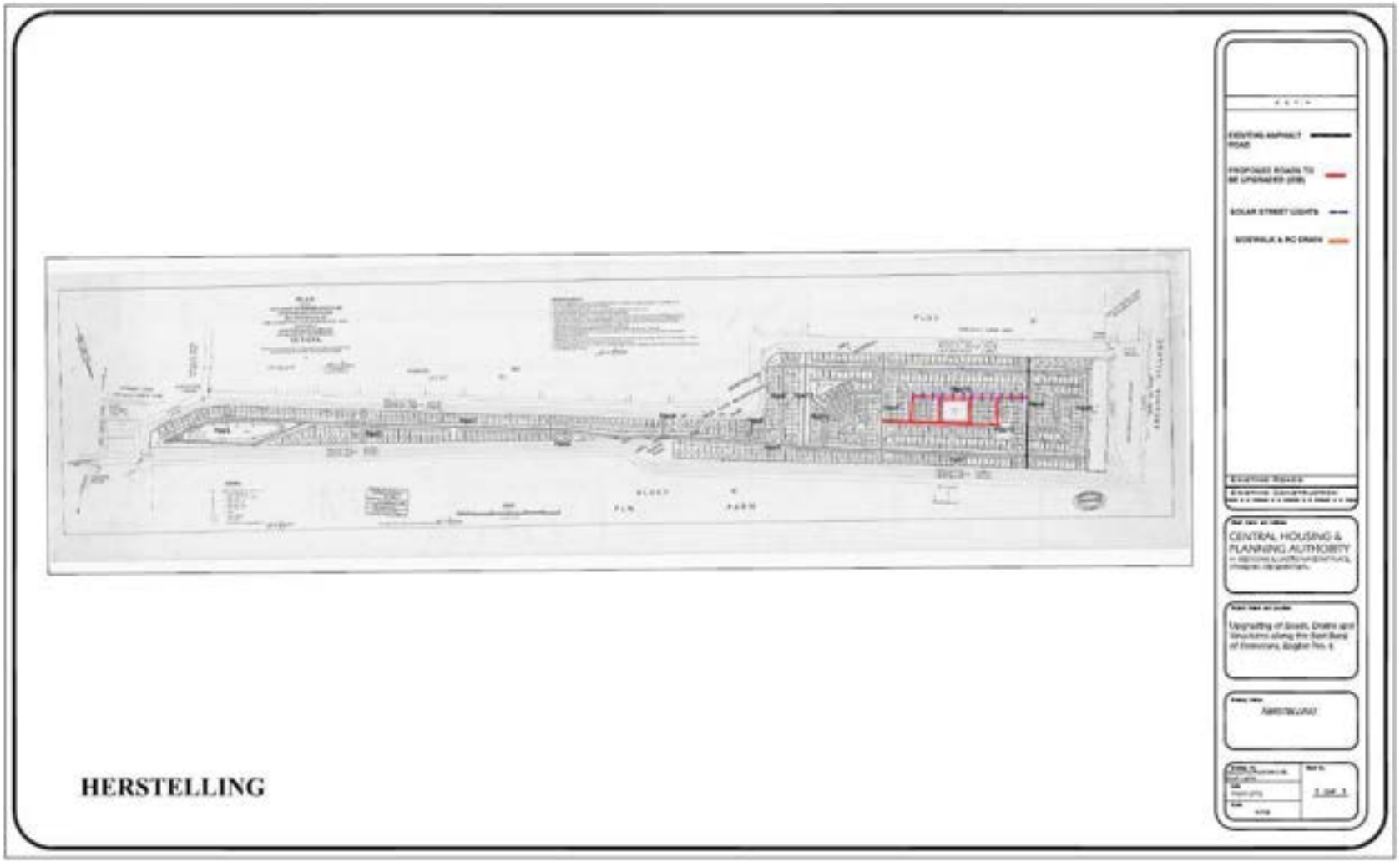


Figure 2-16: Location of Project Intervention Works in Herstelling

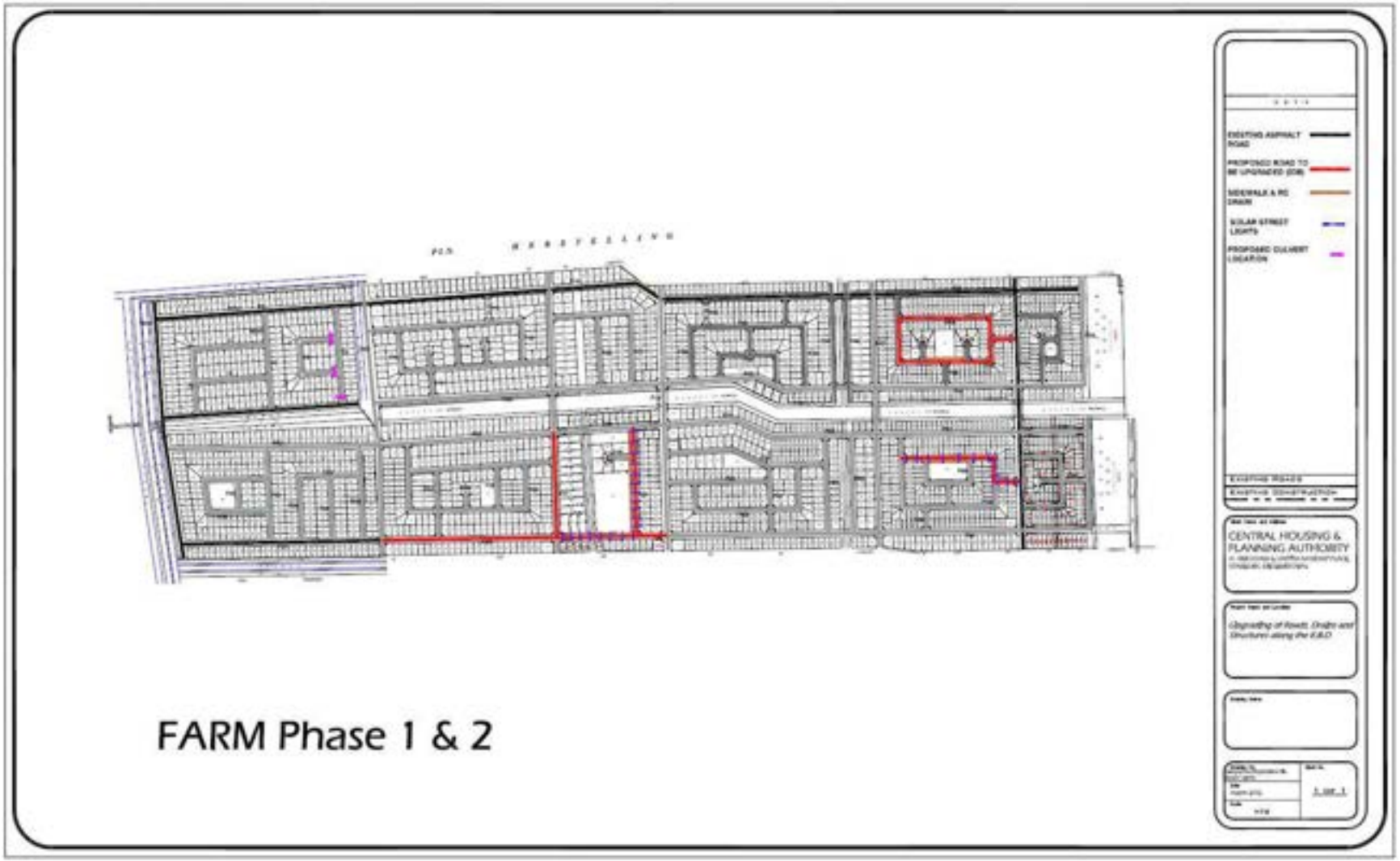


Figure 2-17: Location of Project Intervention Works in Farm Phase 1 and 2

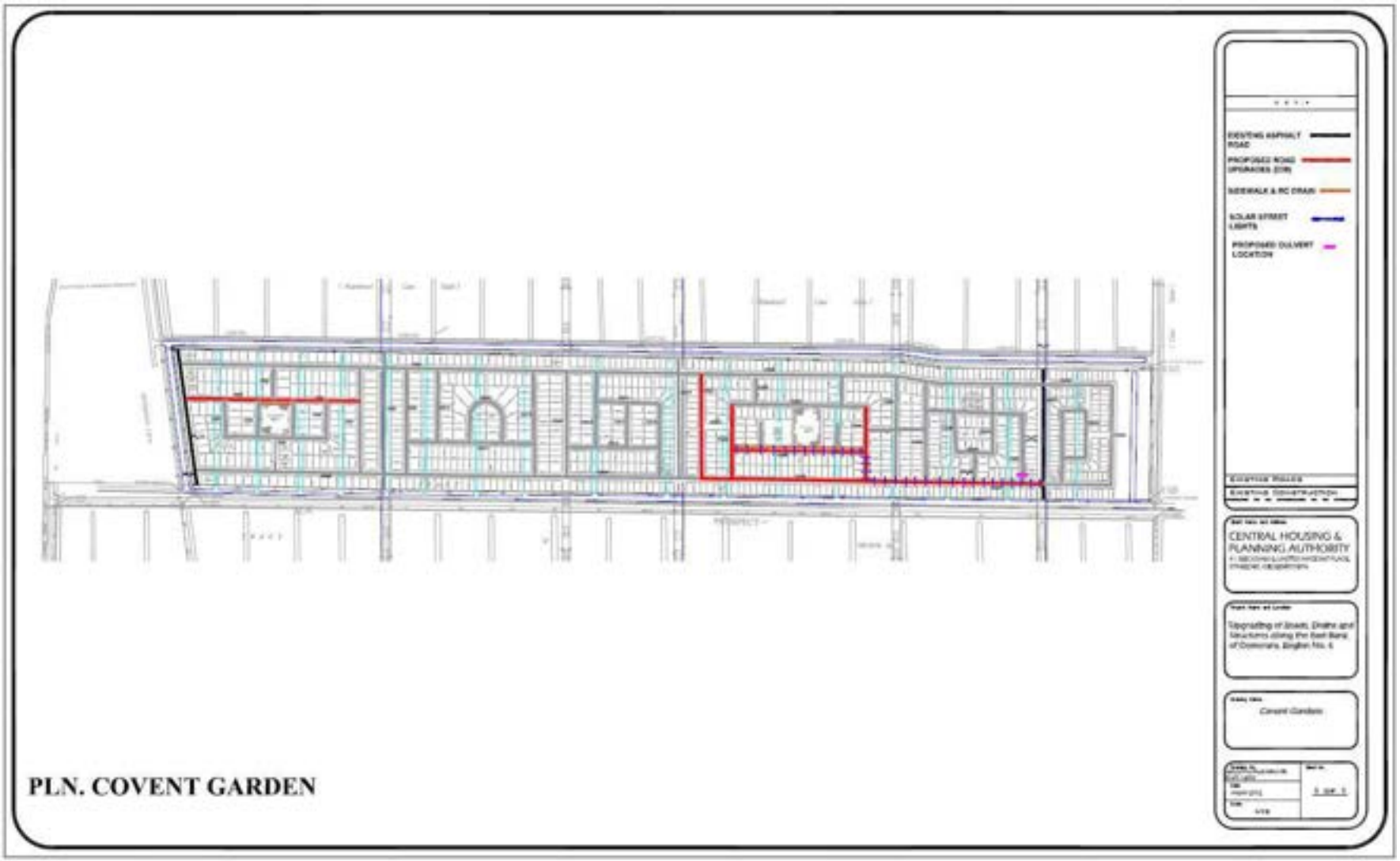


Figure 2-18: Location of Project Intervention Works in Covent Garden

3.0 POLICY, LEGAL, INSTITUTIONAL AND REGULATORY FRAMEWORK

3.1 Overview

The project will improve selected streets and drains, construct sidewalks, and install culverts and street lighting within the project areas. This section provides an overview of the relevant national policies, legislation and institutional framework related to the project which are relevant to the implementation of infrastructure works in Guyana. The IDB policies relevant to the project are also discussed.

3.2 Policies, Strategies and Plans

The key national policies relating to the infrastructure and housing sectors, and environmental management are described in this section.

3.2.1 National Development Strategy

The National Development Strategy (NDS) 2001-2010[4] prepared by the Government of Guyana sets out the primary development policy framework for Guyana. It provides a framework for national planning and captures a number of cross-sectoral issues such as infrastructure, environment, forestry, agriculture, mining, tourism and fisheries, among others.

The NDS identified six (6) major constraints that are faced by Guyana as a result of poor infrastructure (mainly, Guyana's road network) and, as a consequence, has outlined measures aimed at improving the road network system. The NDS states that the *gross inadequacy of our transport system militates against our social and economic development in several ways*. Annex 8 of the NDS focused directly on transportation and the road networks. The NDS also speaks of a number of proposed developments to improve infrastructure across the country to facilitate the sustainable development of the country and improvement in livelihoods. Infrastructure development outlined in the NDS includes improvement of existing roadways, construction of new roads, construction of bridges, improvement of existing airstrips and construction of new ones, etc.

Chapter 23 of the NDS focuses on the housing sector and outlines several initiatives to be undertaken to improve housing for Guyanese. The project fits within the objectives of the NDS. The provision of house lots and the necessary infrastructure for housing development is a key recommendation of the NDS.

Further, the NDS stipulates that environmental considerations should underpin all aspects of development, whether physical or social and further, that Guyana's development must not threaten the integrity of the environment. Provision of infrastructure should therefore address issues of environmental, economic and social sustainability. Specifically, the NDS states that attention has to be given to monitoring and enforcement and actions to improve environmental management practices.

3.2.2 Low Carbon Development Strategy

[4] While the duration is from 2001 – 2010 currently it is still considered to be in use.

The Guyana Low Carbon Development Strategy (LCDS) 2030 was developed to create a new low carbon economy by harnessing Guyana's unique advantage of enhanced capacity. The LCDS 2030 will create a new low-carbon economy in Guyana by establishing incentives which values the world ecosystem services, and promote these as essential components of a new model of global development with sustainability at its core. This will allow Guyana to harness the value of the country's ecosystem services to build a long-term, low-carbon diverse opportunity.

There are four objectives of the LCDS 2030, which provide guidance on the implementation and advancement of the Strategy's goal. These are:

1. Forest Climate Services and other Ecosystem Services
2. Stimulate future growth through clean energy and sustainable economic activities
3. Protect against climate change
4. Align with global climate goals

The LCDS 2030 sets out how to accelerate the achievement of these four objectives. Planning for sustainable development is the core principle that guides the LCDS 2030. As it relates to the improvement of the physical resources the focus will be on upgrading Guyana's energy, transportation, digital, water, and housing infrastructure on a low-carbon, non-polluting trajectory. The LCDS states that as Guyana positions itself for a sustainable future premised on a low-carbon and climate-resilient pathway, sustainable planning and urban development policies must be implemented in conjunction with sustainable designs that integrate environmental, economic, and social sustainability, where Guyana's development trajectory is viewed and based on its interactions with the surrounding environment.

As it relates to communities the LCDS recognizes the challenges of congestion in urban and rural areas, including improper solid waste disposal, flooding, low-density expansion, inefficient modes of transit and car dependency, which threaten sustainability and inclusive growth, and the achievement of a low-carbon, climate-resilient economy. In recognizing the growth opportunities offered by a low-carbon economy, and to mitigate the challenges experienced, Guyana will embark on context-specific, solution-oriented sustainability planning that is aimed at responding to local socio-economic and ecological issues. This approach will not only support physical planning of cities but also position approaches for regional and territorial development. While urban planning can be seen in simplistic terms as controlling the physical development of urban areas, in a rapidly developing and transitioning economy such as Guyana's, an Urban Development Policy and Plan are the tools that define the trajectory of this growth.

3.2.3 National Land Use Plan

The National Land Use Plan prepared in 2013 highlights that the main demand for housing is at the East Coast Demerara but available land is at a premium. As a result, the CHPA have been concentrating on establishing housing areas on the East Bank Demerara and in Region 3. The project area is located along the East Bank Demerara. The National Land Use Plan also recommended that the development of housing and industry is also a primary option on the coastal plain and states that there is the potential for developing housing on abandoned agricultural land but housing developments need to be better planned in relation to both their location and to other land uses. The Plan also states that, with improved access and other development, industrial sites can be developed and could be located either on poor quality, abandoned frontlands or could even be located in backland areas providing that access and power are provided. This project will

contribute to the utilization of unused agricultural lands in the backlands area. However, the National Land Use Plan also recommended that primary agricultural lands should be avoided.

3.2.4 National Environmental Action Plan

The National Environmental Action Plan (NEAP) (1994) was one of the first efforts towards integrated environmental planning and outlines the focus of Government of Guyana as it relates to environmental management. The NEAP outlined several policy objectives. One of the policy objectives calls for the Government to ensure that environmental assessments of proposed development activities which may significantly affect the environment are undertaken. In keeping with this environmental policy objective, the Environmental Protection Act was introduced.

The NEAP was revised (2001-2005) and set out the *"environmental development strategy for Guyana for five years"* and *"a framework for integrating cross-sectoral environmental concerns in the broader context of the country's economic and social development programme".*

3.2.5 Disaster Risk Management

Several initiatives have been pursued by the GoG with regards to disaster risk management and response. Among these include the development of legislation, implementation strategies, management plans, procedures, guidelines, damage assessment and needs analysis system, early warning system, and coordination platforms. A Disaster Risk Management Bill, National Disaster Risk Management Policy and Early Warning System Framework document, National Flood Plan, Community Based Integrated Disaster Risk Management Plan, Integrated Disaster Risk Management Agriculture and Environment Plan, National Public Education Plan, among other instruments have been prepared.[5]

Through IDB support, the GoG, in 2013 prepared a 10-year National Integrated Disaster Risk Management Plan and Implementation Strategy (NIDRMP) with the intention to guide the implementation of projects and initiatives in Guyana – at national, regional and local levels – that are required in order to meet the NIDRMP's strategic objectives of risk identification, prevention/mitigation, financial protection/risk transfer, preparedness/response and recovery. In addition, the Civil Defence Commission (CDC), with support from the United Nations Development Programme, developed a Multi-Hazard Disaster Preparedness and Response Plan (MHPRP) in 2013. The MHPRP sought to detail arrangements to cope with the effects of natural and/or man-made disasters occurring in Guyana and to assign responsibilities and to provide coordination of emergency activities connected with major disasters, in general and specific ways.

3.3 Legislative Framework

Several laws exist in Guyana which are applicable to this project. The relevant pieces of legislation are discussed below:

3.3.1 Constitution on Guyana

The Constitution is the supreme law of Guyana and outlines, inter alia, the branches and powers of Government, the rights of Guyanese, and the principles for the political, economic and social

[5] CDC, 2013, Multi-Hazard Disaster Preparedness and Response Plan. Pg. 9

systems. All other laws must be in keeping with the provisions of the Constitution. Specifically, Articles 2:25 and 2:36 of the Constitution provides the base for a national environmental policy and emphasizes these as key principles for the functioning of Guyana's social and economic systems.
Article 2:25 of the Constitution states that *"every citizen has a duty to participate in activities to improve the environment and protect the health of the nation".* And Article 2:36 states that *"in the interest of the present and future generations the state will protect rational use of its flora and fauna and will take all appropriate measures to conserve and improve the environment".*

3.3.2 Environmental Protection Act

Environmental protection and management is governed by the Environmental Protection Act 1996. The act is the first comprehensive environmental legislation in Guyana and established and detailed the functions of the EPA. The Act provides for *"the management, conservation, protection and improvement of the environment, the prevention and/or control of pollution, the assessment of the impact of economic development on the environment, the sustainable use of natural resources and for matters incidental thereto connected therewith".* Under the Act the EPA is mandated to coordinate environmental management and outlines the legal process for undertaking sustainable and effective management of the natural environment.

The Act is currently being implemented as a planning mechanism for the approval of new developments that may cause environmental impacts. It also provides the basic regulatory and administrative framework for pollution control. The Environmental Protection Act, No. 11 of 1996 outlines the Environmental Authorisation process for certain new or existing projects being modified. Part IV of the Act requires all developers of any project listed in the fourth schedule or other projects that may significantly affect the environment to apply to the EPA for an Environmental Authorisation. This process is outlined below:

- The Application Form for Environmental Authorisation is submitted to the EPA. This form, which must be accompanied by the prescribed fee, must include a description of the project as well as information regarding location, size, design, duration of the project, and potential environmental impacts. A non-technical summary of the project is also to be attached.

- The EPA will review the application and assess whether or not the project should be exempted from the Environmental Impact Assessment process. The may entail a visit to the project site.

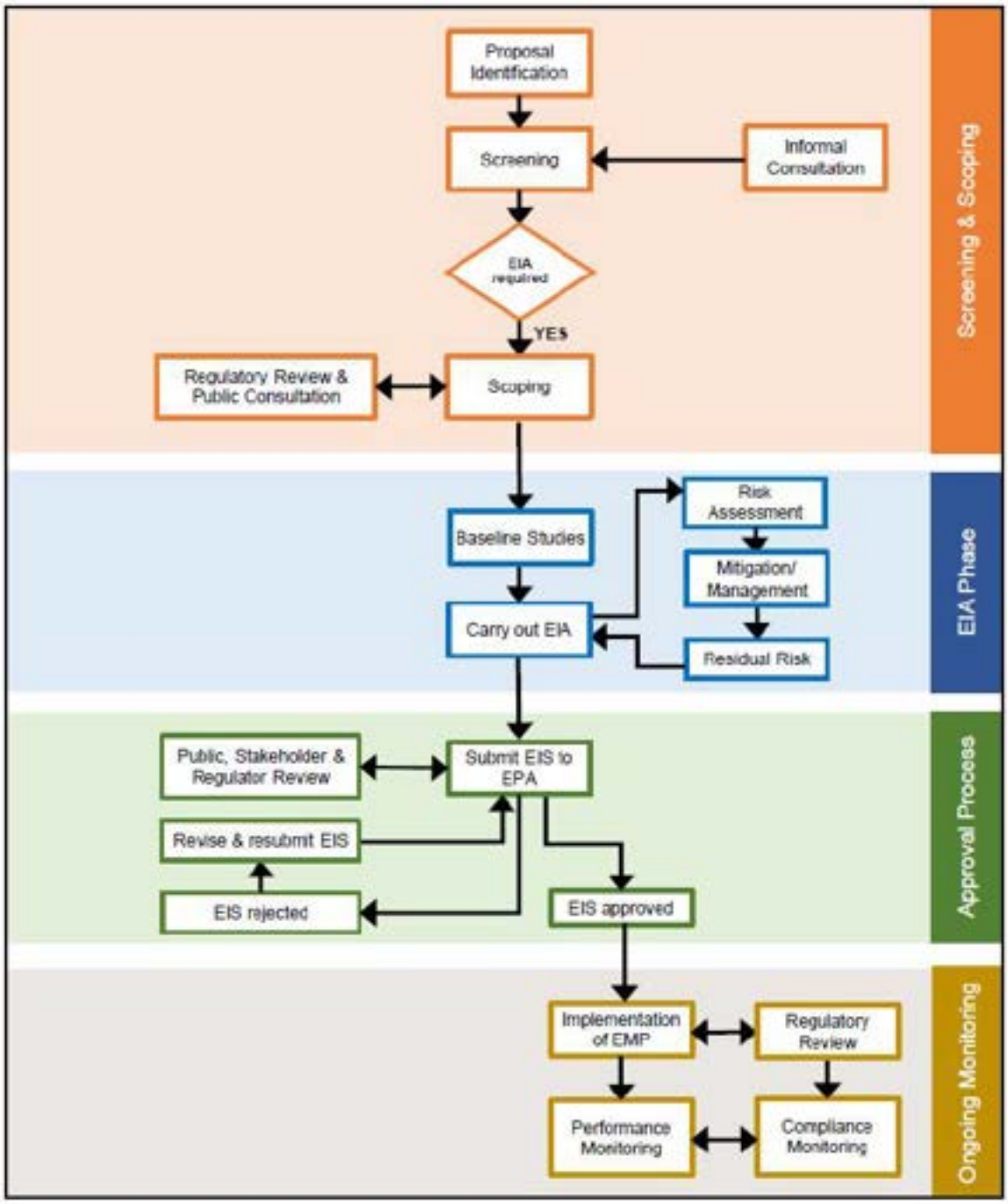
- Once a decision has been made, the EPA will publish a notice to the public in at least one daily newspaper informing of EPA's position, thereby allowing the public review of the decision. The public has 30 days to appeal against the EPA's decision.

- If there is no objection an Environmental Authorisation is issued.

If The EPA decides that an EIA is required then the process outlined for EIAs in Figure 3-1 is to be followed.

Under the Environmental Protection Act, a project of this nature may require an Environmental Authorisation from the EPA in the form of a Construction Permit. If an Environmental Authorisation is required and is granted, the EPA will then monitor the project to ensure compliance

with the conditions of the permit and other requirements. Figure 3-1 shows the process of screening, permitting and monitoring of projects by the EPA.



Source: EPA EIA Guidelines 2020

Figure 3-1: EPA's Process for Screening, Permitting and Monitoring of Projects

3.3.3 Environmental Protection Regulations

Regulations on Hazardous Waste Management, Water Quality, Air Quality and Noise Management

were established under the Environmental Protection Act in 2000. These pollution management regulations were developed to regulate and control the activities of developmental project during their construction and operation phases.
As it relates noise management, national standards were prepared which stipulates decibel level limits for various types of activities. For construction projects the noise limits applicable are 90 dB during the day and 75 dB at nights.

For water quality interim national standards were developed relating to the discharge of effluents. Limits are set out for various parameters for which compliance is required. Parameters relating to this project for which limits are established are presented in Table 3-1.

Table 3-1: Relevant Parameters and Maximum Allowable Limits

Parameters	Maximum Allowable Limits
pH	5.0 to 9.0
Total Suspended Solids (TSS)	<100 mg/L
Oil and Grease	<20 mg/L
Total Dissolved Solids (TDS)	<200 mg/L
Turbidity[6]	<50 NTU
Dissolved Oxygen	>5
Total Coliforms	< count per 100 ml

For air quality any operation that emits any air contaminant apply to the EPA for an environmental authorization. The EPA is supposed to establish desirable air pollution limits. However, currently, there are no nationally determined or established air quality standards. The EPA is guided by and utilises air quality guidelines from the World Health Organisation (WHO), United States Environmental Protection Agency (USEPA) allowable limits and other reputable international organisations. The air quality parameter which is of concern for this project is particulate matter. The WHO limits for particulate matter is presented in Table 3-2.

Table 3-2: WHO Air Quality Standards

Element	Averaging Period	Acceptable Limit
Particulate Matter (PM_{10})	24-hour	50 g/m^3
Particulate Matter ($PM_{2.5}$)	24-hour	25 g/m^3

Regarding hazardous waste generation and management, the contractor is expected to generate small quantities of hazardous wastes which are expected to be managed in compliance with these regulations. Hazardous waste expected to be generated includes waste oil and used batteries. These are to be properly collected, stored, transported and disposed.

3.3.4 Environmental Protection (Litter Enforcement) Regulations

In 2013 the Environmental Protection (Litter Enforcement) Regulations was enacted. These Regulations provide for the enforcement against litter offences. It is an offence under these

[6] In accordance with the Mining (Amendment) Regulations 2005 since the Interim Effluent Discharge Standards did not include a limit for turbidity.

Regulations to place litter in a public place, permit or cause another person to litter a public place or have litter on private premises that pose a health risk. Under the Litter Prevention Regulations, the contractor will have to ensure that solid waste generated is managed and disposed of in an acceptable manner.

3.3.5 Land Acquisition for Public Purposes Act 1914

The Land Acquisition for Public Purposes Act covers expropriation of land required for public works including roads. This Act gives the GoG the power to enter upon any piece of land (with the consent of the occupier) and acquire said land for road work, etc. Therefore, if any land is needed for the project, it can be acquired under this Act, even if it is occupied by a private person, and that person will be compensated by the GoG for the value of their land and any structure. The Act states that in determining claims for compensation, the GoG may consider: the market value of the land; losses to earnings; losses due to severance and relocation expenses.

Given the current design and the initial scoping exercise, it is not envisaged that any land acquisition will be required. However, if for some reason the Government has to acquire any portion of land or property, this will be guided by the Act.

3.3.6 Housing Act, 1948

This Act established the CHPA and outlines how the Agency should conduct its affairs. The Act gives the CHPA the mandate to adequately develop the housing sector to provide for the needs of the working class. This include acquiring of lands and development of schemes. It is under this mandate that the CHPA is pursuing its housing development initiatives across the country, including in Region 3. One of the main objectives of this project is to allow the CHPA to provide proper infrastructure for the improvement of the housing scheme.

3.3.7 Town and Country Planning Act, 1948

This Act makes provision for the orderly and progressive development of lands, cities, towns and other areas including both urban and rural and to preserve and improve the amenities within these areas. The Act outlines the procedures for the development of schemes. It also outlines how collaboration should occur between the CHPA and the local government authorities and also gives the powers to authorities to carry out enforcement to ensure the all development activities within an area conforms to the requirements.

3.3.8 Labour Act

The Labour Act of 1942 specifies the conditions that an employer must observe in the contracting employees. For example, Part V specifies that the entire wages of the employee must be paid as money and not otherwise. However, in occupations where it is customary to make partial payment of allowances in the form of food, toiletries, housing etc. these are acceptable and not considered illegal, if both the employer and employee are agreed on such terms.

This Act ensures that workers under this project are not mistreated and have proper representation to ensure that they are treated properly and paid adequately for their services.

3.3.9 Occupational Safety and Health Act

The Occupational Safety and Health Act 1997 defines the responsibilities of management and workers with respect to safety and health and applies to every workplace in Guyana. The Act makes provisions for the registration of industrial establishments, the establishment of an Occupational Safety and Health Authority, the establishment of a National Advisory Council on Occupation Safety and Health, the duties of employers, workers and other persons, treatments of accidents and occupational diseases, and occupational safety and health regulations. The Act authorises OH&S inspectors to enter and inspect workplaces. The Contractor will have to comply with the provisions of this Act in relation to workers.

3.4 Multilateral Environmental Agreements

3.4.1 United Nations Sustainable Development Goals[7]

The United Nations Agenda for Sustainable Development includes 17 Sustainable Development Goals (SGDs) that are aimed at a strategic approach to providing a better and sustainable future to all. Guyana adopted the 2030 Developmental Agenda in September 2015. The overall project contributes to the realising the SDGs. Goal 11 focuses on Sustainable Cities and Communities. Making cities sustainable means creating career and business opportunities, safe and affordable housing, and building resilient societies and economies. It involves investment in public transport, creating green public spaces, and improving urban planning and management in participatory and inclusive ways. Targets under this SDG includes that, by 2030, ensure access for all to adequate, safe and affordable housing and basic services and upgrade slums, provide access to safe, affordable, accessible and sustainable transport systems for all, improving road safety, notably by expanding public transport, with special attention to the needs of those in vulnerable situations, women, children, persons with disabilities and older persons. The Adequate Housing and Urban Accessibility Programme contributes directly to these targets by providing improved infrastructure for access, drainage and safety within developing communities, thus contributing overall to the improvement of these communities and the welfare of the residents.

3.5 IDB's Safeguards and Policies

In addition to the national policies and legislation, the project is required to comply with the policies of the IDB. The IDB applies environmental and social safeguard policies, standards and guidelines to projects it supports. Safeguards are applied to ensure that project funds are engaged in a manner consistent with the Bank's institutional policies with respect to environmental and social management. Safeguards are applied in two manner, firstly, environmental and social considerations are integrated into the screening process of all projects, and secondly, during project implementation negative impacts are prevented or minimised through the identification, monitoring and mitigation of potential issues.

In November 2021 the IDB commenced implementation of a new Environmental and Social Policy Framework (ESPF) which consists of ten modernized environmental and social performance standards. The ESPF will supersede the existing environmental and social (E&S) risk and impact management sections of five previous policies: Environment and Safeguards Compliance Policy (OP-703); Disaster Risk Management Policy (OP-704); Involuntary Resettlement Policy (OP-710); Policy on Gender Equality in Development (OP-761); and Indigenous Peoples Policy (OP-765). However, the ESPF is applied to new projects only. This project commenced in 2012 as the "Road

[7] https://www.un.org/sustainabledevelopment/health/

Network Upgrade and Expansion Program" (GY-L1031) and was reformulated in 2017 to the "Adequate Housing and Urban Accessibility Programme". Therefore, the AHUAP is considered as an existing operation to which the previous E&S policies apply.

According to project documents, the project has triggered the IDB's Environment and Safeguards Compliance Policy (Operational Policy OP-703) and the project has been categorized as a Category B Programme, which means that negative environmental and social impacts of the programme activities are likely to be mostly local and short-term, and can be readily mitigated with effective mitigation measures. Table 3-3 outlines the policy directives of OP-703 and discusses their relevance to the project. The project will have to comply with these requirements as well as the programme's ESMF.

Table 3-3: Policy Directives of OP-703 – Environmental and Safeguards Compliance

Policy Directive	Aspect (if applicable)	Relevance to the Project
B.1. Bank Policies	OP-102: The Access to Information Policy.	The IDB to determine whether this ESA contains information subject to the Access to Information Exceptions List. If it is not on the Exceptions List, the ESA and other environmental and social safeguard documents are to be posted to the Bank's and the PEU's websites.
	OP-710: The Involuntary Resettlement Policy.	This Policy is not expected to be triggered since no resettlement is required. However, if land or property acquisition is required, the CHPA will first seek the Bank's approval for resettlement and prepare a resettlement plan for the Bank's approval in line with OP-710.
	OP-704: The Natural and Unexpected Disasters Policy.	The risk profile of natural hazards relating to the project were examined. The key natural hazard which presents a risk to the project is flooding.
	OP-761: Gender and Equality in Development.	The CHPA will have to ensure that the operation will not affect women or gender equality negatively and will offer opportunities to promote gender equality or women's empowerment. Improving infrastructure within communities will contribute to achieving these objectives.
	OP-765: The Indigenous Peoples Policy.	This policy is not expected to be triggered since the project site is not located in close proximity to any Indigenous community.
B.2. Country laws and Regulations	Compliance with national environmental laws and regulations and with multilateral	The project must comply with national legislation on environment, and occupational safety and health as stated in the ESA.

Policy Directive	Aspect (if applicable)	Relevance to the Project
	environmental agreements.	
B.3. Screening and Classification	Classification of the risk level.	The project has been classified a Category B Programme by the IDB because the negative environmental and social impacts are likely to be mostly local and short-term, and can be readily mitigated with effective mitigation measures.
B.4. Other Risk Factors	Capacity of executing agency for environmental governance, high environmental and social risks, vulnerability to natural disasters.	The CHPA has in place a structure to ensure environmental oversight of projects, including having environmental and social personnel assigned to the project.
B5. Environmental Assessment Requirements	Requirements for various types of environmental assessments including ESMPs.	CHPA has commissioned the conduct of this ESA which includes an ESMP.
B.6 Consultation	Consultation	Stakeholders' consultation was initially done by the CHPA and again by the Consultant as part of the ESA process. A Stakeholder Engagement Plan that is scaled to the programme risks and impacts was prepared as part of the ESA, along with a grievance redress mechanism to receive and facilitate resolution of affected communities' concerns and grievances. Engagements are expected to continue throughout the project implementation.
B.7. Supervision and Compliance	Monitoring	CHPA has in place a structure to supervise and monitor the project and will ensure allocation of budget for monitoring activities. CHPA will also prepare the required reports, including reports which may be required by the EPA and the IDB.
B10. Hazardous Materials	Production, use and disposal of hazardous substances.	Small quantities of hazardous materials such as waste oil, paint residues, etc. may be generated at some of the construction sites. Management measures will guide storage, transport and disposal.
B.11. Pollution Prevention and Abatement	Water, air, noise and waste pollution management.	The project will implement management and mitigation measures for any adverse impacts on water quality, air quality, noise

Policy Directive	Aspect (if applicable)	Relevance to the Project
		management, hazardous waste, and litter prevention.
B. 16 In-Country Systems	Utilizing in-country systems to manage environmental and social impacts.	In-country system to manage potential environmental and social impacts from the project does not apply. Instead, the Bank's policies will apply.
B.17 Procurement	Safeguards for procurement incorporated into loan agreements, operating regulations and bidding documents.	CHPA will have to ensure that environmental, social, health, and safety related requirements are included in procurement documents such as bidding documents.

3.6 Institutional Framework

The key institutions which will have oversight during the implementation of the project are described in this section.

3.6.1 Environmental Protection Agency

The EPA was established under the EP Act of 1996. The Agency is governed by a Board of Directors, and falls under the direct supervision of the Department of Environment within the Ministry of the Presidency. In Sec. 4 (1) (a), of the Act, the EPA is given the mandate to *"take such steps as are necessary for the effective management of the natural environment so as to ensure conservation, protection and sustainable use of its natural resources*". In addition, the Agency is given the overall responsibility to:

- Take necessary steps for effective management of the natural environment to ensure conservation, protection and sustainable use of its natural resources;
- Ensure that any developmental activity, which may cause an adverse effect on the natural environment, is assessed before such activity is commenced;
- Coordinate and maintain a programme for the conservation of biological diversity and its sustainable use; and
- Coordinate the establishment of national parks and protected areas system and a wildlife protection management programme.

In fulfilling the above listed functions, the EPA is required to ensure projects such as infrastructure projects are authorized and are in compliance with the environmental requirements. Once an environmental authorisation is issued the EPA may conduct period monitoring of project activities to ensure environmental compliance.

3.6.2 Central Housing and Planning Authority

The CHPA was established in 1948, under the Housing Act, to address the housing needs of the citizens of Guyana. CHPA is under the purview of the Ministry of Housing and Water and has the following primary objectives:

- Divestment of Government land to eligible Guyanese for residential use.
- Development of housing schemes and regularization and upgrade of squatter settlements.
- Orderly and progressive development of Land, Cities, Towns, Urban and Rural areas.
- Granting security of tenure, (Transports and Certificates of Title to Land).
- Preparation of development plans for urban centers.
- Provision of services (access roads, internal road networks, water distribution networks, drainage, electricity).
- Collaboration with stakeholders for the development of sustainable communities.

CHPA has the responsibility for the planning and implementation of Government of Guyana housing schemes as well as undertaking squatter regularisation. In making land available for housing purposes the Agency ensures that the necessary infrastructure is in place. It is as a result of providing these services that the CHPA is spearheading the implementation of this project which will significantly benefit existing housing development within the project area.

The CHPA Projects Department will implement the project and has the capacity to provide environmental and social oversight of project activities. The Health, Safety and Environmental (HSE) Unit of the CHPA is mandated to provide HSE functional and technical support on locally and foreign funded infrastructure and building projects. The HSE Unit was established under the Projects Department, given that this Department is the main project execution arm of the CHPA. Further, and for this reason, the HSE Unit is better able to provide HSE management support to those projects, which are under the portfolio of the Projects Department. The HSE Unit is currently headed by an HSE Manager (previously termed the Environmental and Social Safeguards Coordinator), and four Environmental and Social Technical Officers (see Figure 3-1 for the HSE Unit's Staff Structure). The CHPA will dedicate an Environmental and Social Technical Officer to the project. The main roles and responsibilities of the HSE Unit are as follows:

- Provide HSE functional and technical support to the Agency's Supervision Management Team, and the Contractor's Construction Management Team;
- Implement Environmental and Social Management Plans (ESMPs) and undertake Environmental Social Safeguards Site Surveys, and Feasibility Studies;
- Conduct HSE monitoring and daily inspections, and provide guidance to Contractors and the Department's engineering team on the implementation of ESMPs and corrective actions;
- Provide technical support to the Community Development Department in executing the Agency's Stakeholder Engagement Plan (SEP), which includes conducting regular stakeholder awareness sessions with project affected communities; to provide project updates, address grievances, carry-out sensitization, garner stakeholder feedback, and foster discussions and stakeholder participation;
- Lead incident investigations; prepare incident/accident notifications and investigation reports (for communication of significant incidents to agency leaders (CEO, Ministers);
- Ensure that Contractors HSE activities comply with the Multilateral Development Bank (MDB) safeguard policies, local legislation, CHPA and Contractors HSE Policies, Plans and Procedures, and conform to the Contract HSE Schedule;
- Prepare and analyze the daily and weekly HSE Contractor compliance site reports and performance and propose the necessary improvement actions to improve HSE awareness, onsite management and culture;
- Consolidate Environmental and Social Management Requirements, including HSE Evaluation Criteria for Project tender documents;

- Lead HSE Evaluation of Project Tenders; and
- Undertake HSE Reporting on HSE Compliance and Project HSE Management.

Figure 3-1: Current Staffing Structure of HSE Unit

3.6.3 Local Government (Regional and Neighbourhood Democratic Councils)

The local government system is enshrined in the Constitution of Guyana. Chapter VII, section 71(1) state that local government is a vital aspect of democracy and shall be organised so as to involve as many people as possible in the task of managing and developing the communities in which they live. The Ministry of Local Government and Regional Development has the responsibility for overseeing local government, which comprises the Regional Democratic Councils (RDCs), the municipalities and the Neighbourhood Democratic Councils (NDCs). The maintenance of public roads outside of Georgetown is the responsibility of the RDCs. They also coordinate the activities of local NDCs, providing support where necessary, and are responsible for overseeing public works and supporting the NDC's. The NDCs are required to provide services such as solid waste collection and disposal, sanitation, rehabilitation of roads and dams and operation of markets, etc. These NDCs have the jurisdiction to play a part of the entire planning process, especially in the area of community engagements, allocation of areas for site facilities and storage of materials, disposal of waste, drainage, etc. The Regional Democratic Council Region 4 is the RDC which has oversight for the project area. The NDCs within the districts the project area falls are the Eccles – Ramsburg NDC and the Little Diamond – Herstelling NDC.

3.6.4 IDB

The IDB is providing the funding for this project and as such, it is anticipated that there will be some oversight of the project by the IDB, especially to ensure that its policies and safeguards are being complied with. The project was screened by the IDB to determine the applicable safeguard policies and the level of environmental and social assessment and management planning required. It is expected that, during the construction phase, there will be close liaison between the IDB's Safeguards Specialists and the CHPA to identify and address any challenges encountered or compliance issues. This may require periodic visit of the Specialists to the project site and periodic reporting to the IDB on environmental and social safeguards management by the CHPA during the execution of the works.

4.0 ENVIRONMENTAL AND ASSOCIATED SOCIAL CONDITIONS

4.1 Overview

Geographically, the project spans several communities along the East Bank Demerera between Peter's Hall to Covent Garden. These communities include Peter's Hall, Providence (Phase Two North and South), Perseverance, Herstelling, Farm (Phases One and Two) and Covent Garden. However, the works that are to be undertaken are sparsely dispersed between these six communities. The project area, therefore, has been defined to encompass the overall potential area of influence of the project, taking into account that each infrastructure work outlined in Chapter Two may have a different zone of influence based on the actual location of works within the six communities.

This chapter therefore presents a description of the environmental and socio-economic baseline conditions of the potential area of influence (AOI), prior to the commencement of intervention activities. The baseline assessment provides a basis to estimate potential impacts of the Project and information that is critical to decision-making, regarding construction activities and mitigation measures and monitoring programs. Baseline conditions of the potential AOI were therefore examined under three categories which are:

1. Physical Environment
2. Biological Environment
3. Socio-economic Environment

Information pertaining to baseline conditions within the project area was obtained primarily through field observation, interviews, and literature review. Several site visits were conducted throughout the duration of the study to collect data from the project area. A one-day site visit was conducted by team members on December16th, 2022 in order to initiate the field assessment. The main purposes of this site visit were to perform a walkover for familiarization and to collect site specific data, and identify the exact locations for water quality sampling, and air and noise measurement points. A preliminary survey of the environmental baseline conditions across the various communities and within the area of potential influence was performed.

A second visit to the various sites was conducted on January 13th, 2023. Activities conducted during this site visit included a terrestrial survey, water quality sampling and analysis, noise level measurements and air quality measurements for ambient air quality. In addition, public consultation meetings commenced with primary stakeholders such as nearby residents and commercial entities, which continued for several weeks based on stakeholders' availability and willingness to participate. As noted, the project environment was examined under three categories, the physical, biological and socio-economic environment. Each of these categories was characterised based on review of existing information, as well as baseline studies conducted by the team of specialists commissioned to execute this study. Baseline studies conducted by the team included:

- Water Quality Analyses;
- Noise Level Measurements;
- Air Quality Testing;
- Biological Assessment; and
- Socio-economic Assessment.

4.2 Physical Environment

As indicated, the project area comprises six communities along the East Bank Demerara between Peter's Hall to Covent Garden, whereby, the interventions will be done within existing CHPA housing schemes.

4.2.1 Geology

According to the Guyana's National Land Use Plan (NLUP), 2013, Guyana is usually considered to consist of four (4) main natural regions: Coastal Plain, Hilly Sand and Clay Region, Interior Savannahs and Forested Highlands. The project sites are located within the coastal plain of Guyana. The coastal plain is a narrow belt (ranging between 8 and 65 km in width with a length of 440 km) stretching from the Corentyne River in the east to Waini Point in the west. Studies by Bleackley (1956) on the stratigraphy of the coastal plain have resulted in the identification of four formations: The Demerara Clay, Coropina Formation, White Sand Series, and Berbice Formation. These four formations are essentially comprised of a sequence of unconsolidated sediments considered to be of Plio-Pleistocene to recent age overlying a Precambrian age basement complex of metamorphic, magmatic and volcanic rocks of the Guiana Shield. According to Bleackley (1956) datum, the stratigraphy of the coastal plain is of the following:

1. The Demerara Clay and Coropina Formations – The average thickness is 45 m and are commonly known as the uppermost clay, overlying the White Sand Series. The Coropina Formation or old coastal plain is a reddish-yellowish compact clay overlain by the recent grey-brown Demerara Clay, which extends seaward ~ 15 km. The area covered by the above clays is poorly drained and marshes and coastal lagoons are developed on it. The clays, which contain brackish water, confine the upper part of the White Sand complex.

2. The White Sand Series Formation - This series consists of up to 1500 m of a clastic sequence that extends from the Essequibo River in the west to the Corentyne River in the southeast, through Suriname. Laterally, the formations develop into the following bearing units:

    a. The Upper Sand Series of loose angular quartz sand 15—55 m thick. It is known also as the uppermost confined coastal aquifer, is usually of brackish water close to the coast and along the river channels, and is subject to tidal effects;

    b. Intermediate Clay and Sand Series, a predominantly argillaceous unit ~ 90 m thick underlying the Upper Sand. Although locally water can be tapped from its sandy intervals, it is considered as an aquitard between the Upper Sand and deeper aquifers;

    c. Lower Sand Series (Bleackley's A sands) consists of a 12--30 m thick unit of quartz sand and gravels and forms the major coastal aquifer. Although it is only found at 90 m depth in the perimeter (Essequibo), it is 220 m deep in Georgetown and more than 300 m in the central part of the basin. Its drop-in depth is accompanied by a thickening of the unit from 12 to 30 m.

    d. The Alternating Sand and Clay Beds, a sequence of 65-130 m of sand and clay underlying the Lower Sand; and

e. The B Sands - This unit consists of alternating cemented sand and hard shale. In Georgetown, it is 12--22 m thick and becomes less identifiable in the central part of the coastal plain. Water quality is excellent, and the temperature higher than that of the A Sands.

3. The Berbice Formation - This formation constitutes some 375m of Cretaceous indurated conglomerate and sandstone with shale intercalations overlying the basement complex.

4. The Basement Complex – Metamorphic, magmatic and volcanic rocks of Precambrian age form the basement complex of the Guiana Shield. The exposed contacts between the basement and the White Sand Series delineate the boundary of the coastal artesian basin.

Specifically, the project area is underlain by migmatites (younger granites). The granite bedrock is overlain by quaternary marine clays. Modern fluvial deposits associated with the Demerara overlie these deposits. This alluvium appears to have high clay content.

4.2.2 Soils and Topography

According to the NLUP (2013), the coastal plain is part of the flat, low-lying coastal lands that extend along the coast of South America from the Amazon River in Brazil to the Orinoco River in Venezuela. The coastal plain is composed of a great variety of soils developed from a variety of parent materials such as marine and fluvio-marine deposits with back-swamp organic soils. In general, the soils closer to the shore and along rivers are more fertile than the soils behind which can have very low fertility and toxicity in some instances.

Soils mapped within the landscape of the project sites are described as low humic gleys of high base status, marine phase "frontland clay" (Hydraquents with Sulfaquents, Fluvaquents). In Guyana, this mapping unit occurs mainly on the coastal plain of eastern Guyana from the Essequibo to the Corentyne River stretching some 32 km inland in places. It contains relatively fertile, poorly drained clay soils developed on unconsolidated sediments with associated sandy ‘reefs’ that are old beach ridges. Some saline soils and organic ‘pegasse’ soils also occur in patches. In much of the coastal plain, these soils have a land use of rice and sugar cultivation along with coconuts on the sandy reefs. As classified in the Land Capability Classification Map of North-eastern British Guiana (FAO, 1964), the natural occurring soils of the landscape of the project sites are classified as Class I-II, that is, good to moderate agriculture land of soils with naturally poor drainage, deep, mainly clays with silty soil often associated with rivers, and sandy soils in intermittent strips paralleling the coast. Fertility is relatively high but with small, scattered, elevated inland areas with low fertility.

The landscape of the coastal plain is flat. Typical ground level is 1m below mean sea level at the coast rising gradually inland to approximately 8m above sea level at the junction of the White Sand Formation immediately south of the Coastal Plain.

The average natural land elevation of the area is 16:00 GD (Georgetown Datum), being 1.2 m below the elevation of the main East Bank Demerara Road. The site elevation data indicate the land elevation is below the recorded flood elevation of 16.429 GD. As such, there is the need for extensive land filling, drainage and retainment of the landfill for the entire area.

4.2.3 Climate and Meteorology

Just near the equator from about 5^0 North and 5^0 South, the north-east trade winds and the south-east trade winds converge in a low-pressure zone known as the Inter Tropical Convergence Zone (ITCZ). Guyana is uniquely positioned within this zone of convergence and, as such, the country's weather and climatic conditions are heavily influenced by the seasonal shifts of this zone. The movement of the ITCZ over Guyana's coast, where the project sites are located, brings with it heavy rainfall that coincides with the rainy seasons generally occurring between May to August and November to January. Meanwhile, when the ITCZ lies outside of Guyana's borders from February to April; and August to October much lower levels of precipitation are experienced, which coincide, with the two dry seasons. Annual rainfall is approximately 2000-2500 mm. The intensity of rainfall at the general project area varies throughout the year with an average annual rainfall of 2000 mm. February to April and September to November are the driest periods of the year. Rainfall data for the past Twenty-four years was obtained from the Hydrometeorlogical Department for the Sam Atta Point Weather Station, which is within close proximity to the project sites. The rainfall data is presented in Table 4-1 and the rainfall pattern can be observed in Figure 4-1.

Table 4-1: Monthly Rainfall Data (mm) for Wales Station for 2000-2019[8]

Year	Months											
	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
1998	38.6	7.6	7.6	100.3	76.2	53.3	53.3	53.3	25.6	40.8	44.8	68.4
1999	62.0	13.2	56.6	75.2	45.2	82.4	30.0	78.5	32.9	44.8	52.7	83.4
2000	97.1	14.0	34.2	96.0	85.5	83.1	67.4	71.9	52.7	15.8	154.0	37.6
2001	34.0	11.2	7.2	39.8	93.0	76.3	93.0	20.6	44.1	25.8	41.3	52.6
2002	80.7	18.7	52.8	68.2	66.3	76.3	34.5	35.0	23.0	41.7	38.8	31.2
2003	13.0	19.7	16.7	18.7	46.3	42.8	32.0	25.8	39.4	6.6	29.0	73.6
2004	29.3	51.0	26.0	39.4	46.4	41.8	42.9	20.0	14.0	13.7	4.0	34.4
2005	167.3	43.5	7.5	87.0	100.2	28.0	92.8	13.8	32.3	15.7	48.9	90.6
2006	71.0	22.9	29.2	56.4	71.3	91.1	47.7	21.3	59.8	18.4	58.4	52.3
2007	37.3	12.4	23.7	41.3	72.4	-	69.6	75.8	34.4	-	-	-
2008	-	-	-	-	-	-	-	-	-	-	-	-
2009	-	-	-	-	-	-	-	-	-	-	-	-
2010	-	6.6	5.3	49.3	69.3	34.6	-	-	-	-	-	-
2011	41.0	121.1	83.6	12.8	68.2	67.5	86.7	60.2	62.1	45.7	21.1	65.1
2012	72.4	73.4	20.3	28.8	49.5	46.3	58.0	24.3	24.7	28.1	58.0	34.4
2013	44.1	32.8	10.5	30.0	42.5	110.8	70.4	37.0	86.0	22.2	65.9	74.0
2014	58.4	42.2	36.5	13.4	29.6	48.9	27.2	17.4	29.8	29.8	86.4	44.3
2015	68.0	48.8	21.4	35.8	66.2	47.4	137.4	34.2	43.1	16.8	59.0	46.1
2016	13.0	13.6	32.9	59.5	48.7	45.1	105.5	30.1	31.1	10.3	71.7	77.8
2017	76.6	86.5	76.8	58.9	30.6	93.5	35.7	37.4	68.4	48.0	65.3	61.4
2018	47.9	37.2	30.6	75.7	55.9	50.7	82.9	64.4	51.5	20.9	38.8	11.4
2019	10.5	27.8	8.9	47.1	36.4	34.4	47.6	47.1	77.7	65.3	64.1	23.6
2020	9.3	5.2	32.1	32.5	85.7	49.3	75.0	52.3	75.0	19.8	115.5	82.0
2021	58.0	11.4	52.9	47.7	85.9	104.5	48.0	25.9	35.1	67.8	35.4	63.0

[8] Hydrometeorological Service, Ministry of Agriculture

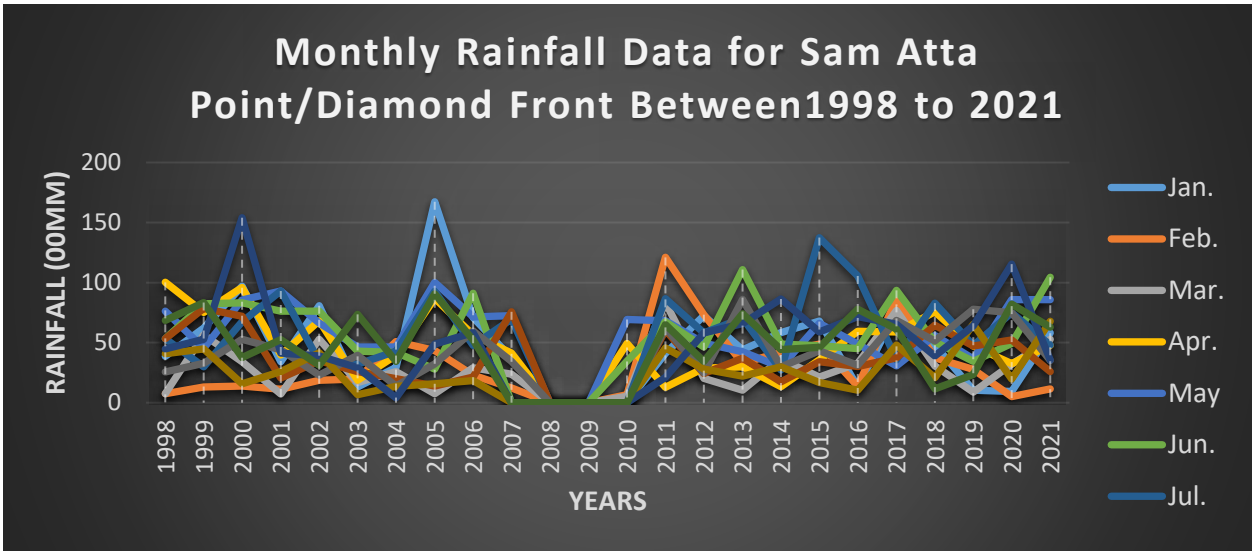


Figure 4-1: Rainfall Pattern for Sam Atta Point/Diamond Front (1998-2021)

Wind speed is generally 1.5 to 2.5 mph in east to northeast direction. On the coast, daily maximum temperatures average 29.6 ^{0}C, while daily minimum temperatures average 24.0 ^{0}C. Guyana's coast is subject to the north-easterly trade winds with speeds of about 6 meters per second. Even though the coast is situated in the trade winds, tropical storms or cyclones do not occur along Guyana's coast. Winds and offshore wave directions are remarkably consistent with nearly sixty percent (60%) coming from the 450 north-east sector with an average velocity at sea of 6 m/s. Wind and waves are strongest during the months of December to June and weakest during the period July to November. The mean sea level within the area is approximately 15.52 m above GD.

4.2.4 Hydrology and Drainage

Except for the coastal backlands, the coastal plain is characterized by large to enormous quantities of brackish to saline water available throughout the year from tidal influenced rivers, streams, coastal marshes, mangrove swamps, and tidal lowlands. Generally, drainage along the East Bank of Demerara, where the communities for intervention are situated, is by canals regulated by sluices that empty into the Demerara River.

The hydrology of these areas are largely controlled by its situation in the lower floodplain of the Demerara. The soils within the general area are likely to be clay rich, with poor internal drainage. Much of the drainage in the general area of the East Bank Demerara is done by canals which empty into the Demerara River and is regulated by sluices. The pattern of settlement along East Bank Demerara resulted in the construction of numerous drainage ditches which lead into these main canals.

Drainage therefore within the general project area is typical to that in communities throughout the coastal plain, whereby a network of interconnected earthen drains and primary canals facilitate the flow of storm waters off the land. The areas are drained by small ditches along the road side which empty into primary drains or canals. The entire project area is drained by small drains which feed into trenches which empty into the Demerara River and is regulated by sluices and pumps.

4.2.5 Surface Water Quality

An analysis of the surface water quality within some of the main areas that are identified for construction activities were conducted. A total of ten (10) samples were collected from roadside drains, both earthen and concrete, and analysed. Water samples being collected are shown in Figure 4-2. The locations where the samples were collected are identified in Figure 4-3. These locations were chosen based on clusters, magnitude and proximity to the proposed construction works.

Figure 3-2: Water Samples Collected from Roadside Drains Identified for Intervention within the Various Communities

Confirmation on the background quality of surface water within the project area was necessary since, should there be any impact on water quality as a result of project activities during both the construction and post construction phases, the impact can be detected by collecting and testing samples from the same locations and comparing the results to those of the baseline water quality provided in this report. A description of the surface water sample locations is provided in the Table 4-2. At the time of sampling, the weather conditions varied from an overcast condition to mostly sunny, with clear sky and in some cases windy, with no rainfall.

Table 4-2: Description of Surface Water Sample Locations and Sampling Details

Sample ID	Coordinates	Location Description	Weather Condition	Date Sampled	Time Sampled (h)
SW 1	21N 0376605 0752931	Peter's Hall (West – PH6)	Overcast	January 13, 2023	10:15
SW 2	21N 0373283 0747378	Peter's Hall (East – PH9)	Cloudy	January 13, 2023	10:35
SW 3	21N 0372756 0746764	Perseverance (P13)	Sunny	January 13, 2023	10:51
SW 4	21N 0372746 0746879	Providence (North – PVN 23/25/27)	Sunny	January 13, 2023	11:17
SW 5	21N 0372510 0746160	Providence (South – PV18)	Sunny	January 13, 2023	11:35
SW 6	21N 0372761 0746852	Herstelling (HPC10)	Sunny	January 13, 2023	11:50
SW 7	21N 0371218 0745052	Farm (East- F50)	Sunny	January 13, 2023	12:05
SW 8	21N 0370127 0744839	Farm (West – F26/27)	Sunny	January 13, 2023	12:25
SW 9	21N 0370807 0744213	Covent Garden (East – CG35/36)	Sunny	January 13, 2023	12:38
SW 10	21N 0369287 0744865	Covent Garden (West – CG4)	Sunny	January 13, 2023	13:05

It is important to note that the area has been generally disturbed for a number of years due to past and ongoing anthropogenic activities which include sugarcane cultivation and currently, housing development. The samples collected were analysed for several parameters which are important and generally used to determine the quality of water. Parameters analysed include temperature, pH, Turbidity, Dissolved Oxygen and Total Dissolved Solids. In the absence of a national standard, background water quality comparison was made with the Guyana National Bureau Standards (GNBS), GYS 262:2004 Specification for Drinking Water and GYS 207:2002 Interim Guidelines for Industrial Effluent Discharge into the Environment. These limits are included in the results table. All analyses were done in the fields via the use of portable handheld water quality testing devices. Samples analyses can be observed in Figure 4-4. The result of the water quality analysis is presented in the Table 4-2.

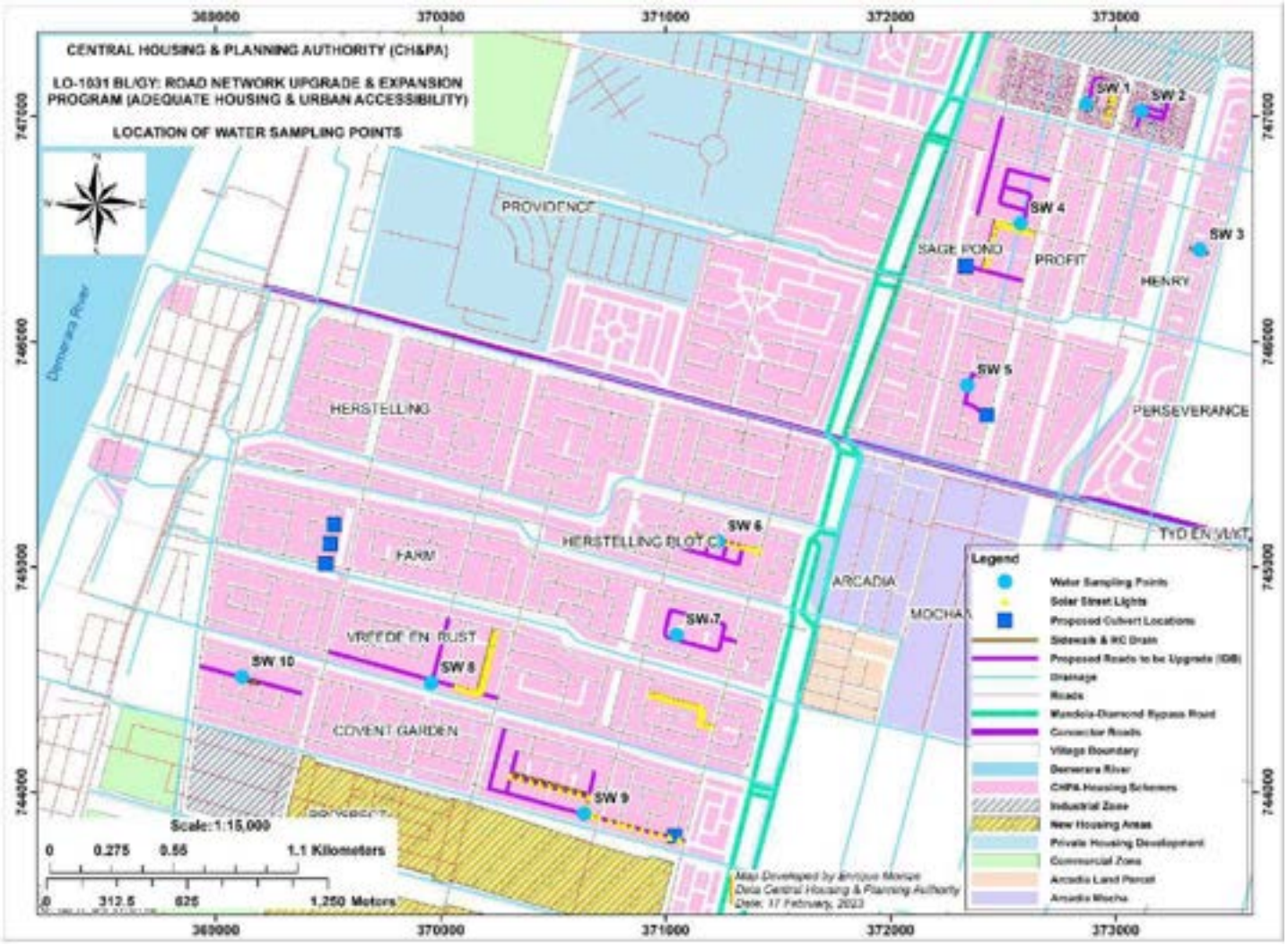


Figure 4-3: Surface Water Sample Locations

Figure 4-4: Conducting *In Situ* Water Quality Analyses

Table 4-3: Results of Water Analysis Conducted in the Field

Sample ID	Parameters				
	pH 5-9	**Temp. (^{0}C) <40**	**TDS (mg/L) <200**	**DO (mg/L) >5**	**Turbidity (NTU 25)**
SW 1	8.70	32.5	120	4.25	26.6
SW 2	7.66	31.2	232	2.12	79.0
SW 3	7.90	32.1	77	3.70	23.1
SW 4	7.74	32.6	108	4.25	63.2
SW 5	7.18	32.0	289	4.22	106
SW 6	7.50	31.2	154	5.20	84.1
SW 7	7.26	31.7	85	2.13	56.6
SW 8	7.26	31.3	100	1.95	42.0
SW 9	6.86	33.6	91	1.84	29.0
SW 10	6.86	33.8	64	1.40	46.7

Key
Temp. – Temperature
TDS - Total Dissolved Solids
DO - Dissolved Oxygen

Based on the results presented in Table 4-3, most of the parameters analysed suggests that the water quality at the various locations is somewhat within the acceptable limits. The results also show that for each location sampled, the Turbidity levels were way above the acceptable limit, while SW 2 and SW 5 were also above the acceptable level of less than 200mg/L for Total Dissolved Solids. It should be noted that most of the waterbodies sampled at the various locations were heavily silted and had the presence of thick vegetation. Nevertheless, the results indicate that the existing water quality of the area is typical of the water quality for similar type of areas within Guyana.

It is recommended that additional surface water quality testing be done prior to the commencement of construction.

4.2.6 Groundwater

According to the Water Resources Assessment of Guyana, conducted in 1998, large quantities of fresh water are available from the coastal aquifer system which occupies a subsurface area of about 20,000 square kilometers, extending about 250 kilometers along the Atlantic Coast and 40 to 150 kilometers inland. Sediments reach a thickness of 1,800 meters onshore and become progressively thicker offshore and toward the east. The coastal aquifer system is composed of three connected but hydrogeologically distinct aquifers. Overlying layers of clays confine the lower two aquifers, protecting them from contamination by overlying sources. The three aquifers are named, from upper to lower, the Upper Sands, the A Sands, and the B Sands, with each capable of yielding large amounts of water. These layers trend downwards from east to west. The A Sands occur at a depth of 152 m (500 feet), and the B Sands at a depth of 244 m (800 feet).

The untreated water is slightly acidic with a pH range of 6.5 to 8.5. The water contains a low chloride content, low alkalinity and hardness, but high levels of iron. Water from the B Sands has a higher temperature and chloride content, it also contains hydrogen sulphide.

It is common for shallow aquifers along Guyana's coast to be contaminated through both biological and chemical means. Improper disposal of animal and human wastes causes pathogenic contamination, while chemical contamination is primarily related to the use of fertilizers in the sugarcane and rice fields of the coastal lowlands. The Upper Sands aquifer, which is not normally used for water supply, is therefore highly susceptible to both biological and chemical contamination, particularly in the Georgetown area and the now highly populated East Bank Demerara area to which the six communities for intervention are situated.

The water is generally brackish to saline. Overuse of aquifers in coastal areas may result in saltwater intrusion. The Upper Sands and A Sands aquifers have elevated iron contents, and the B Sands has elevated temperatures and a hydrogen sulfide odour. While data concerning the deeper A and B Sand aquifers indicate that they are confined, contamination is still possible from recharge areas or improperly constructed wells. Contamination plumes generally follow the flow direction and slope of the ground water, making areas downslope of the populated sites susceptible. Fracture systems typically transport contamination in a variety of directions very quickly and not necessarily downslope. The average shallow groundwater depth is between 1 m to 2 m of the ground surface.

4.2.7 Noise

A noise survey was conducted within the project area in order to determine the current decibel levels. Measurements were recorded at ten (10) of the intervention sites. These sites were chosen based on clusters, magnitude and proximity to the proposed construction works. Figure 4-5 shows

noise measurement being taken at one of the ten locations. The locations of these sites are shown in Figure 4-6. All of the measurements taken were lower than the GNBS limits of 75 dB (maximum) for residential areas except for N7 which was slightly over the 75 dB due to music playing in the background. Details of the noise surveys are outlined Table 4-4.

Figure 4-5: Conducting Noise Measurement within the Project Area

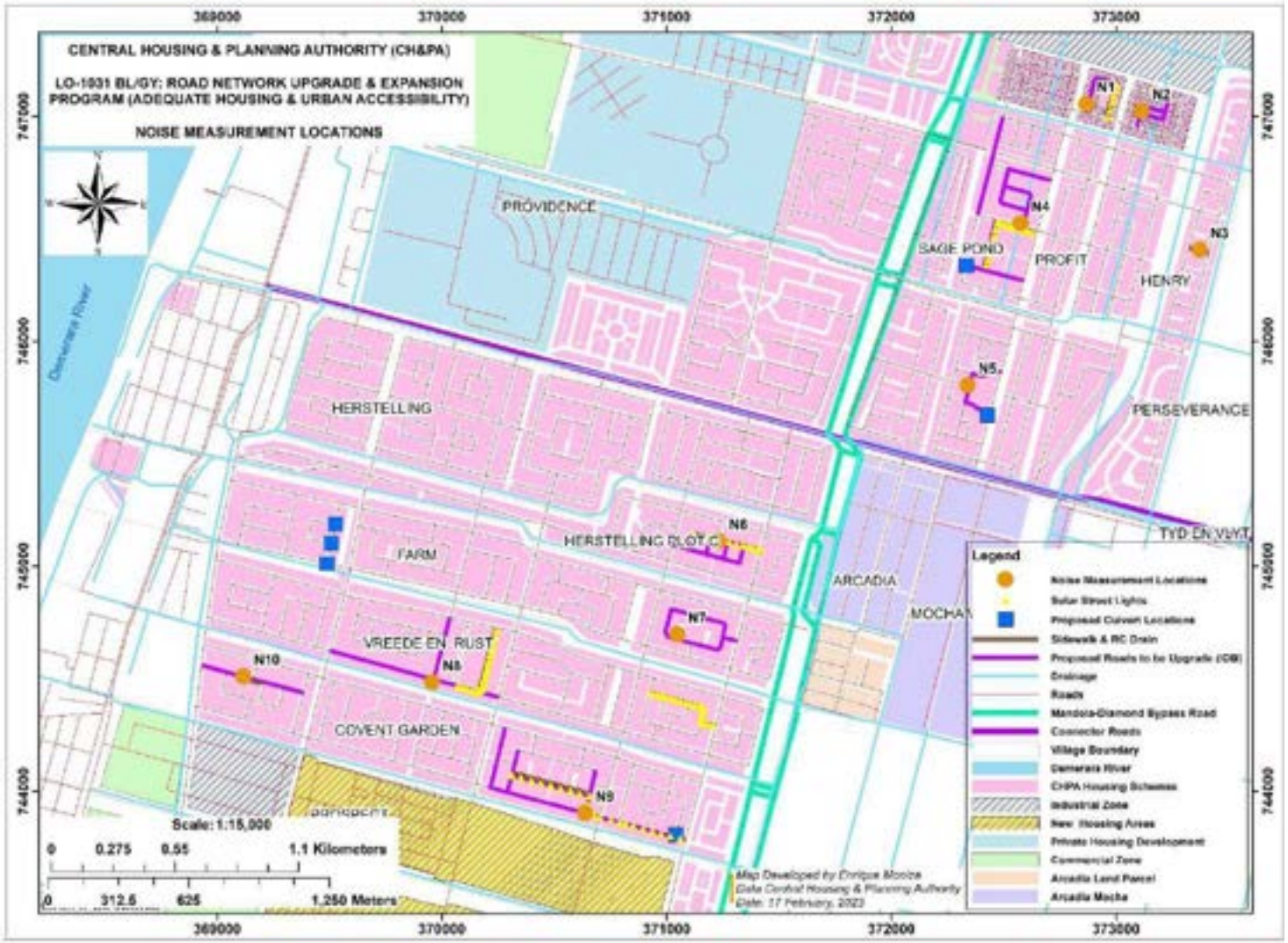


Figure 4-6: Location of the Noise Measurement Points

Table 4-4: Noise Levels Recorded at Various Locations within Project Area

Sample ID	Location Description	Coordinates	Weather Condition	Time	Decibel Level		Comments
					Low	High	
N1	Peter's Hall (West – PH6)	21N 0376605 0752931	Sunny	10:18	49.6	67.9	Noise from weeding (brush cutter) influenced noise levels
N2	Peter's Hall (East – PH9)	21N 0373283 0747378	Sunny	10:33	39.5	66.6	Background music influenced noise levels
N3	Perseverance (P13)	21N 0372756 0746764	Sunny	10:55	38.2	62.8	Noise from construction tools influenced noise levels
N4	Providence (North – PVN 23/25/27)	21N 0372746 0746879	Sunny	11:13	39.6	67.2	Noise from householder generator influenced noise levels
N5	Providence (South – PV18)	21N 0372510 0746160	Sunny	11:34	48.1	72.9	Ice cream cart music influenced noise levels
N6	Herstelling (HPC10)	21N 0372761 0746852	Sunny	11:48	50.6	68.8	Background music and generator noise influenced noise levels
N7	Farm (East-F50)	21N 0371218 0745052	Sunny	12:05	45.1	78.0	Background music influenced noise levels
N8	Farm (West – F26/27)	21N 0370127 0744839	Sunny	12:27	33.5	62.5	Wind and vegetation influenced noise levels
N9	Covent Garden (East – CG35/36)	21N 0370807 0744213	Sunny	12:35	33.4	69.2	Background music influenced noise levels
N10	Covent Garden (West – CG4)	21N 0369287 0744865	Sunny	13:03	30.9	63.9	Background music influenced noise levels

4.2.8 Air Quality

Ambient air quality measurements were conducted within the project area so as to establish baseline levels of particulates. Particulate matter measured were $PM_{2.5}$ and PM_{10}. Measurements were recorded at ten (10) sites. These sites were chosen based on clusters, magnitude and proximity to the proposed construction works. Figure 4-6 shows air quality measurements being recorded at one of the ten locations. The locations of these sites are shown in Figure 4-8. A description of the air quality testing locations is provided in the Table 4-5.

Figure 4-7: Conducting Air Quality Testing within the Project Area

Table 4-5: Description of Air Quality Measurement Locations

Sample ID	Coordinates	Sample Location	Date Sampled	Time Sampled (h)	Weather Condition
AQ 1	Peter's Hall (West – PH6)	21N 0376605 0752931	January 13, 2023	10:16	Sunny
AQ 2	Peter's Hall (East – PH9)	21N 0373283 0747378	January 13, 2023	10:35	Sunny
AQ 3	Perseverance (P13)	21N 0372756 0746764	January 13, 2023	10:49	Sunny
AQ 4	Providence (North – PVN 23/25/27)	21N 0372746 0746879	January 13, 2023	11:12	Sunny
AQ 5	Providence (South – PV18)	21N 0372510 0746160	January 13, 2023	11:33	Sunny
AQ 6	Herstelling (HPC10)	21N 0372761 0746852	January 13, 2023	11:48	Sunny
AQ 7	Farm (East-F50)	21N 0371218 0745052	January 13, 2023	12:00	Sunny
AQ 8	Farm (West – F26/27)	21N 0370127 0744839	January 13, 2023	12:23	Sunny
AQ 9	Covent Garden (East – CG35/36)	21N 0370807 0744213	January 13, 2023	12:35	Sunny
AQ 10	Covent Garden (West – CG4)	21N 0369287 0744865	January 13, 2023	13:02	Sunny

Based on the readings provided in Table 4-6 below, all measurement locations recorded low levels of particulates for both $PM_{2.5}$ and PM_{10}. This is well within the 62 µg/m^3 threshold for poor ambient air quality. These measurements therefore indicate that the current air quality within the project are is 'good'.

Table 4-6: Results of Air Quality Testing ($PM_{2.5}$ and PM_{10})

Location ID	Temp. ^{O}C	Humidity (%)	Parameters Tested	
			$PM_{2.5}$ (ug/m^3)	PM_{10} (ug/m^3)
AQ 1	53.1	53.1	2.43	3.30
AQ 2	54.1	54.1	2.90	4.10
AQ 3	56.9	56.9	1.90	2.60
AQ 4	57.7	57.7	2.20	2.90
AQ 5	56.6	56.6	2.90	4.00
AQ 6	66.5	66.5	2.70	3.70
AQ 7	54.5	54.5	2.10	2.80
AQ 8	58.0	58.0	2.90	4.00
AQ 9	52.9	52.9	3.20	4.40
AQ 10	49.1	49.1	2.20	2.90

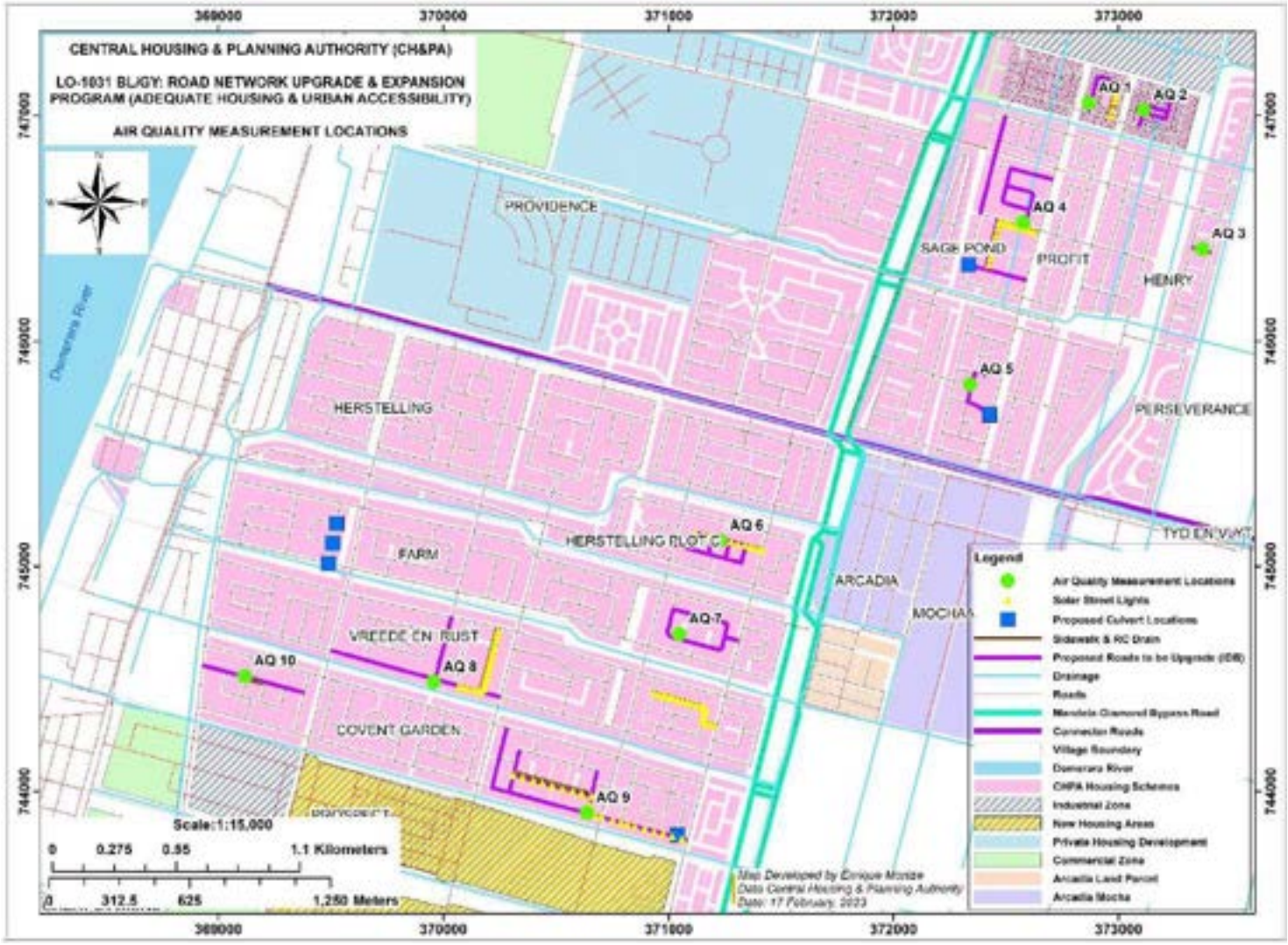


Figure 3-8: Air Quality Measurement Locations

4.3 Biological Environment

4.3.1 Overview

Guyana is divided into three major biogeographical provinces (Guyana/UNEP, 1992) namely: the coastal biogeographical province, the savannah biogeographical province and the forest biogeographical. The project area is located within the Coastal Province which stretches along the low coastal plain. This province is further subdivided into twelve biogeographical provinces, with the project area sitting directly within palustrine ecosystem subdivision. However, the fact that the project area has been constantly subjected to anthropogenic activities over the past decades suggests a shift from its original classification. As such, these areas are now considered to be classified as grasslands with water bodies that follow a linear pattern, with little to no salinity.

The project landscape is typical of all urban coastal habitats, which are largely degraded habitats, comprising mainly of species that adapt and thrive successfully owing to their ability to adapt well to rapidly changing environments.

4.3.2 Method of Assessment

An assessment of the biological environment was conducted using a simple three phase method which is outlined in Figure 3-8 and is further described below.

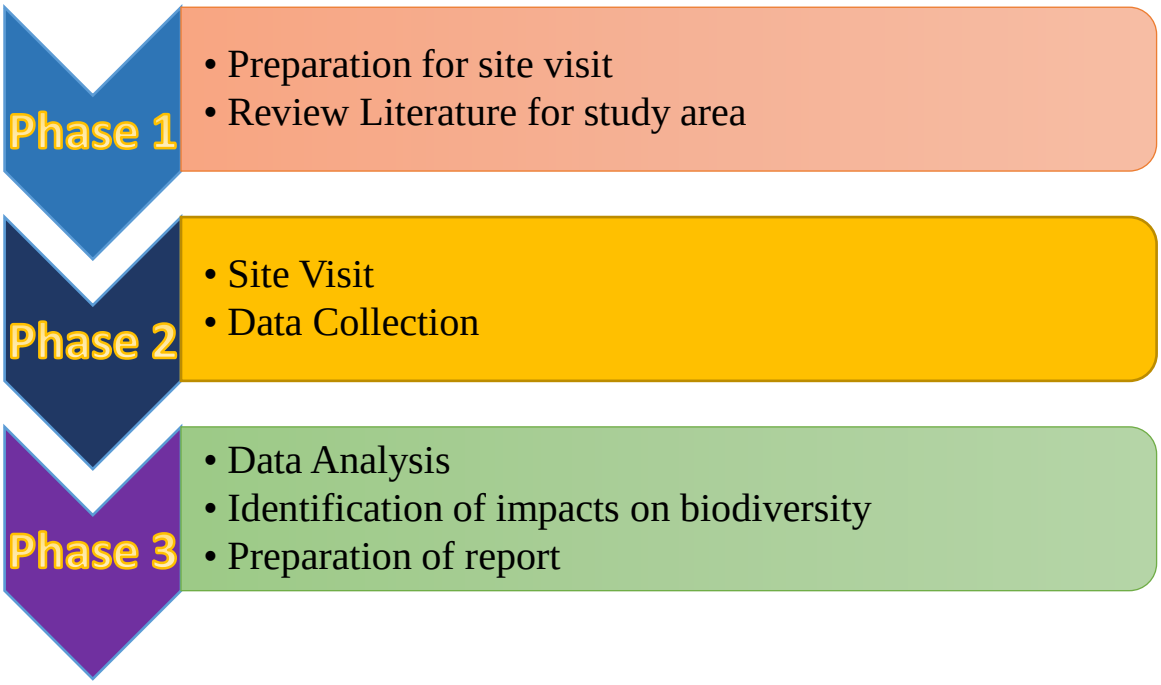


Figure 3-8: Method of Assessment

Phase 1- Preparation for site visit
Prior the site visit, literature was reviewed so as to be familiarized with species, both flora and fauna, that are common in urban areas similar to that of the project area. This also helped in enhancing the list of species compiled during the site visit.

Phase 2- Site visit
The assessment of the biodiversity within the project area was mainly conducted through informal interviews with persons from the area and visual encountered surveys. Interviews were conducted to determine the domesticated flora and fauna within the six communities, whereas visual encountered surveys were done mainly to identify the wildlife species (mainly birds).

Phase 3- Data analysis and preparation of report
Data obtained from literature reviewed and the site visit were compiled to establish baseline lists of species, for both flora and fauna, which are commonly found within the extent of the project area. Possible impacts to the biological environment were also assessed.

4.3.3 Flora

Over the years, the development of lands within the project area has resulted in secondary vegetative growth, which mainly include shrubs and a variety of grass species. These species are resilient and can withstand the impacts of human daily activities. There are a few species that have establish dominance within the project area. These include *Crotalaria incana* (Shake shake), *Cynodon dactylon* (Bahama grass) and *Axonopus compressus* (Carpet grass). Several residents were also observed to have kitchen gardens and a variety of fruit trees commonly grown in Guyana. Larger species includes shrubs such as *Solanum torvum* (turkey berry), *Calotropis gigantean* (Madar).

Table 4-7 provides a list of some common species that are grown by residents within the area for domestic purposes. It is important to note that these crops are grown within the residents' yard and are grown on a very small scale, mainly for home use. Others have planted a variety of fruit trees such as cherries, guava and mangoes. Table 4-8 provides a list species that are commonly found in the area that are not necessarily cultivated.

Table 4-7: Fruits and Vegetables Cultivated Around the Project Area

COMMON NAME	FAMILY	GENUS	SPECIES
FRUITS			
Mango	**Anacardiaceae**	*Mangifera*	*indica*
Coconut	**Arecaceae**	*Cocos*	*nucifera*
Guava	**Myrtaceae**	*Psidium*	*guajava*
Dongs	**Rhamnaceae**	*Ziziphus*	*jujuba*
Cherry	**Rosaceae**	*Prunus*	*avium*
Orange	**Rutaceae**	*Citrus*	*sinensis*
Limes	**Rutaceae**	*Citrus*	*latifolia*
Gooseberry	**Phyllanthaceae**	*Phyllanthus*	*Acidus*
Cashew	**Myrtaceae**	*Syzygium*	*malaccense*
Soursop	**Annonaceae**	*Annona*	*Muricata*
Pomegranates	**Lythraceae**	*Punica*	*granatum*
CASH CROPS			
Eschallot	**Alliaceae**	*Allium*	*cepa*
Eddoes	**Araceae**	*Colocasi*	*esculenta*
Papaya	**Caricaceae**	*Carica*	*papaya*
Carila	**Cucurbitaceae**	*Momordica*	*charantia*
Pumpkin	**Cucurbitaceae**	*Cucurbita*	*maxima*
Squash	**Cucurbitaceae**	*Lagenaria*	*vulgaris*
Watermelon	**Cucurbitaceae**	*Citrullus*	*lanatus*
Bora	**Fabaceae**	*Vigna*	*sesquipedalis*
Broad leaf thyme	**Lamiaceae**	*Plectranthus*	*amboinicus*
Thyme	**Lamiaceae**	*Thymus*	*vulgaris*
Ochro	**Malvaceae**	*Abelmoschus*	*esculentus*
Plantain	**Musaceae**	*Musa*	*balbisiana*
Boulanger	**Solanaceae**	*Solanum*	*melongena*
Sweet peppers	**Solanaceae**	*Capsicum*	*annuum*
Hot peppers	**Solanaceae**	*Capsicum*	-
Tomato	**Solanaceae**	*solanum*	*lycopersicum*

Table 4-8: Flora Species around the Project Area

FAMILY/COMMON NAME	SPECIES NAME	FREQUENCY/COMMENTS
POACEAE		
Burr grass	*Cechrus echinatus*	Very common
Carpet grass	*Axonopus compressus*	Very common
Bahama grass	*Cynodon dactylon*	Very common
Bird seed grass	*Echinochloa colonum*	Very common
Jew grass	*Imperata brasiliensis*	Common
Razor grass	*Paspalum virgatum*	Common
Elephant grass	*Pennisetum purpureum*	Common
CAESALPINIACEAE		
Carrion crow bush	*Cassia alata*	Very common
Money bush	*Cassia obtusifolia*	Very common
Wild coffee	*Cassia occidentalis*	Common
FABACEAE		
Shake-Shake	*Crotalaria incana*	Common
Sweet heart/Watch man	*Desmodium frutescens*	Common
PONTEDERIACEAE		
Water hyacinth	*Eichhornia crassipes*	Common
MIMOSACEAE		
Giant shame bush	*Mimosa pigra*	Common
Shame bush/Goat plimpla	*Mimosa pudica*	Common
ARACEAE		
Moko Moko	*Montricardia arborescens*	Common
ANACARDIACEAE		
Mango	*Mangifera indica*	Common
Golden apple	*Spondias dulcis*	Common
MUSACEAE		
Banana	*Musa acuminata*	Common
MALPIGHIACEAE		
cherry	Malpighia punicifolia	Common
NYMPHACEAE		
Water lily	*Nelumbium nelumbo*	Common in larger canals
SPHENOCLEACEAE		
Soap bush	*Sphenoclea zeylancia*	Common
CECROPIACEAE		
Conga pump	*Cecropia sp.*	Common
MYRTACEAE		
Guava	*Psidium guajava*	Common
Jamoon	*Syzygium cumini*	Common
Aunty Desmond	*Antidesma bunius*	Common
BORAGINAAECEAE		
Clammy Cherry	*Cordia tetranda*	Common
SOLANACEAE		
Night Shade	*Solanum torvum*	Common
APOCYNACEAE		
Madar	*Calotropis gigantea*	Common

Figure 4-9: Floral Species within Project Site: A - Papay (*Carica papaya*), B – Sourie (*Averrhoa bilimbi*), C- (*Cucurbita maxima*), D – (Mangifera indica), E – Coconut (*Cocos nucifera*), F – (*Cecropia peltata*)

Figure 4-10: Floral Species within Project Sites: G – Black Sage (*Salvia mellifera*), H – Sweet potato (*Ipomoea batatas*), I – Water Hyacinth (*Pontederia crassipes*), J - Common Shame Face (*Mimosa pudica*)

4.3.4 Fauna

The diversity of fauna within the project area was as expected. As a result of anthropogenic activities little diversity was observed. However, there are a few species of butterflies, wasps, beetles, birds such as the kiskadee, dove, yellow plantain, etc. Due to the development within the area very few domesticated animals such as cows, sheep and goats were observed. The few that was observed can be seen in nearby playgrounds or pastures. The area is reported to have fishes such as hassar, houri, and sunfish. In rare occasions very few livestock were observed, which is kept for consumption within the family. Table 4-9 list some of the common species that may be encountered within the community. The area also contains reptiles and amphibians including snakes, lizards, and crapauds, none of which are considered threatened or endangered. Faunal species likely to be found within the project area are presented in Table 4-9.

Table 4-9: Common Domesticated Animals Found within the Project Area

COMMON NAME	FAMILY	GENUS	SPECIES	BREED
Ducks	**Anatidae**	*Cairina*	*moschata*	Muscovy duck
		Anas	*platyrhynchos*	Pekin duck
Sheep	**Bovidae**	*Ovis*	*aries*	Barbados Blackbelly sheep
Cows	**Bovidae**	*Bos*	*primigenius*	Brown Swiss
				Holstein
Chicken	**Phasianidae**	*Gallus*	*gallus*	Variety
Horse	**Equidae**	*Equus*	*ferus*	Guyana common breed

Table 4-10: Faunal Diversity within the Project Area

FAMILY/COMMON NAME	SPECIES NAME
VERTEBRATES	
BIRDS	
Columbinidae	
Dove	*Columbina passerine*
ARDEIDAE	
Great Egret	*Egretta alba*
Icteridae	
Yellow Plantain	*Icterus nigrogularis*
Carib Grackle	*Quiscalus lugubris*
Trochilidae	
Spectacled Humming bird	*Schistos geofforyi*
Tudidae	
Cocoa Thrush	*Turdus fumigatus*
Tyrannidae	
Kiskadee	*Pitambus sulphuratus*
JACANIDAE	
Spurwing	*Jacana jacana*
THRAUPIDAE	

FAMILY/COMMON NAME	SPECIES NAME
Peezing	*Volatinia jacarina*
TURDIDAE	
Cocoa Thrush	*Turdus fumigatus*
MAMMALS	
Herpestidae	
Mongoose	*Herpestes auropunctatus*
FISHES	
Cichlidae	
Patwa	*Cichlosoma bimaculata*
Sunfish	*Grenicichla alata*
Erythrinidae	
Huri	*Hoplias malabaricus*
Pimelodinae	
Kasi	*Rhamdia quelen*
Simoridae	
Hassar	*Hoplosternum littorale*
Silverbait	*Astanyax sp*
AMPHIBIANS	
Bufonidae	
Crapaud	*Bufo marinus*
Hylidae	
Water frog	*Hyla sp.*
REPTILES	
Teiidae	
Salipenta	*Tupinambus tebuixin*
Tropiduridae	
Lizard	*Trapidorus hisperus*
Viperidae	
Labaria Snake	*Bothrops atrox*
INVERTEBRATES	
Formicidae	
Ants	*Pheidole sp.*
Scarabaeoidea	
Black beetle	*Deltochilum icarus*
Libellulidae	
Dragon fly	*Erythrodiplax sp*
Pieridae	
Yellow butterfly	*Phoebis argante argante*
Nymphalidae	
White lace butterfly	*Anartia jatrophae*
Pieridae	
Yellow butterfly	*Apnrissa statira statira*

Figure 4-10: Faunal Species within Project Sites: K - Smooth billed ani (*Crotophaga ani*), L – Honey Bee (*Apis mellifera*), M – Snail Hawk *(Rostrhamus sociabilis*), N - Salipenter (*Tupinambus teguixin*)

4.4 Socio-economic Environment

4.4.1 Land Use

The area has a long history of use by agriculture, being occupied by the sugar plantations for over two centuries. The area was converted to housing lands when the Guyana Sugar Corporation (GUYSUCO) discontinued sugar cultivation on the Demerara estates as part of the Government's policy to downsize the industry. Currently, housing occupies most of the areas. The table below indicates when the housing schemes were established by the CHPA.

Table 4-11: Year of Establishment of Housing Schemes

Area	Year Established
Parcel 101 Pln. Peter's Hall	2012
Pln. Providence	2012
Pln. Perseverance	2014
Plot 'C' Pln. Herstelling	2012
Pln. Farm (Phase I)	2012
Pln. Farm (Phase II)	2013
Covent Garden	2013

4.4.2 Access & Transportation

The project areas can be accessed from the East Bank Demerara Public Road via several access roads including the Mocha Arcadia access road, Red Road, and Haags Bosch Landfill Road, and are connected by a number of minor access roads leading into the communities. Access is also available through the recently constructed Mandela Avenue to Eccles four lane. Additionally, the new four lane highway from Eccles to Great Diamond is expected to provide a more efficient route to the project areas by providing an alternative access and significantly reducing traffic congestion.

Residents noted that the minor access roads are not good conditions and are often the source of vehicles damages, and during rainy conditions there are flooded pot holes and access by foot is challenging.

4.4.3 Utilities & Services

The project areas main water supply source is from Guyana Water Inc. (GWI) and is serviced by the potable water wells and a water treatment plant which is located in Covent Garden. Residents have noted that the water supply is not always sufficient to meet their needs, and the water is of poor quality which usually cause damages to clothing and other surfaces. Residents have water tanks which is used to harvest and store rain water for use such as cooking.

The project areas are powered by Guyana Power and Light Inc. (GPL) through the national grid and residents have noted that while the power source is somewhat reliable, although there are frequent low voltage and load sheading in the areas which may cause damage to equipment and other household appliance.

Some sections of the project area do not have access to landline or internet service. However, mobile service and data is provided within the area from GTT and Digicel. Residents noted that

independent internet service providers such as Inet and Enet are available. However, installation cost is high and not affordable to some.

Water mains supplying potable water, landline telephone service with internet, and electrical system are found along the roads connecting with homeowners.

4.4.4 Security

There are no fire stations, police station, or police out posts located within the project areas. The closest police stations are the Providence Police Station, the Diamond/Grove Police Station, and the Mocha Police Outpost. There are two fire stations located in close proximity to the project areas – one in Eccles and the other in Diamond.

Residents are mainly concerned about the lack of street lights within the areas. Provision of lights will provide an additional level of comfort to residents in the project areas that are scarcely populated, or residents may have to walk the streets.

4.4.5 Solid Waste & Sewerage

Residents rely mainly on private contractors for solid waste disposal within the project areas. However, it was indicated that the private contractors are not always reliable and efficient. This results in residents having to burn their garbage as a means of disposal.

There is no connected sewage system or treatment plant within the areas. Residents have septic tanks systems which collects and store sewage on each property.

4.4.6 Population Dynamics

<u>Total Population</u>

The Population and Household Census 2012 shows that the communities combined has a total population of approximately 6,308 people, with a total household count of 2,060. At the time of the Census there was no population data available for Perseverance. The most populated community is listed as Herstelling with approximately 3,225 and a household count of 977, while the least populated was Farm with 456, and a household count 133. It is assumed that communities with the least population and low household count can be attributed to the lack of infrastructure resulting low occupancy.

However, since 2012 there has been significant development in the housing sector, with the opening up of new phases and housing schemes within these areas, as well as the occupation of lots. As a result, there is expected to be a significant increase in population and households within these communities. Some of these areas still have a low occupancy rate due to the lack of adequate infrastructure, and as such, there is expected to be a significant increase in occupancy once there is sufficient access and other infrastructure.

Table 4-12: Population by Communities

Community	Population	Household
Peters' Hall	1261	557
Providence	621	175
Perseverance	Not Available	Not Available
Herstelling	3225	977
Farm	456	133
Covent Garden	745	218
Total	**6,308**	**2,060**

Source: National Census 2012

Population by Sex

The total distribution of population of the project area by sex shows that the female population is greater than the male population in all project sites with the exception of Covent Garden and Farm, where the male population is only marginally greater than the female population. The female population makes up for a total of 51% of the total population, while the male population accounts for 49%.

Table 4-13: Population by Age

Community	Male	Female	Total
Peters' Hall	613	648	**1261**
Providence	296	325	**621**
Perseverance	Not Available	Not Available	**Not Available**
Herstelling	1608	1647	**3255**
Farm	248	208	**456**
Covent Garden	376	369	**745**
Total	**3141**	**3197**	**6338**

Source: National Census 2012

Population by Age

The population by age within the project areas according to the 2012 National Census shows that 50% of the population in the communities are between the ages of 20-54 and represents the prime working age range.

The range between ages 0-19 account for 34% of the population. This data represents school children and young adults that may be enrolled in tertiary and other higher education and vocational training. The population within the ages 55 – 80+ bracket represents 16% of the total population within the communities. Table 4-14 presents the breakdown in the population by age.

Table 4-14: Population by Age

Community	Population by Age Range (Years)				Total
	0-19	20-54	55-79	80+	
Peters' Hall	349	619	222	26	**1261**
Providence	218	247	83	10	**621**
Perseverance	Not Available	Not Available	Not Available	Not Available	**Not Available**
Herstelling	1152	1662	822	26	**3226**
Farm	172	236	45	2	**456**
Covent Garden	277	390	70	4	**745**
Total	**2168**	**3154**	**1242**	**68**	**6308**

Source: National Census 2012

Population Employment Category

The total working population within the project areas according to the Guyana National Census 2012 is 2,606, where 44% of the total working population is employed in the combined sectors of craft and trade operators, plant and machine operators and assemblers, and elementary occupation. 26% of the total employed population is employed in the sale and services sectors, while 21% is employed as a professional, manager, clerical support and armed forces. Skilled agricultural, forestry, and fishery workers account of 6% of the total employed population. The employment of persons within the communities is presented in Table 4-15.

Table 4-15: Population by Employment

Community	Professional	Service/Sale	Agri/Forestry	Other	Student/No work	Total
Peter's Hall	172	124	4	189	0	**489**
Providence	52	83	13	95	0	**254**
Perseverance	Not Available	Not Available	Not Available	Not Available	Not Available	**Not Available**
Herstelling	250	342	29	664	0	**1326**
Farm	8	42	64	83	0	**197**
Covent Garden	68	97	56	119	0	**340**
Total	**550**	**688**	**166**	**1150**	**0**	**2606**

Source: National Census 2012

Population by Income

The total population with a source of income according to the Guyana National Census is 5270, of this total, 49% is self-employed, or employed in jobs in the public and private sectors. 32% is supported by remittance and other forms of financial support from spouse, family and friends locally. 76 or 8% accounts for financial supports from pension, public assistance, and disability benefits, while 1.5% accounts from savings and private investments and other forms of income. The source of income for persons within the communities are presented in Table 4-16.

Table 4-16: Population by Income

Community	Employed	Remittance/ Other Financial Support	Pension/ Public Service Assistance	Savings/ Investments	Other	Total
Peter's Hall	529	290	121	24	1	856
Providence	239	181	48	4	0	472
Perseverance	Not Available	Not Available	Not Available	Not Available	Not Available	Not Available
Herstelling	1334	837	199	40	03	2413
Farm	189	255	21	05	01	441
Covent Garden	304	196	41	03	0	1088
Total	**2595**	**1729**	**430**	**76**	**5**	**5270**

Source: National Census 2012

4.4.7 Gender Gap Analysis

The population by age addressed in Table 4-14 shows the difference in the population of males and females. It was concluded based of the Guyana National Census 2012 that the female population is greater than the male population. The gap in gender in the project areas may be associated with factors such as women and empowerment and homeownership, matriarchal single parent household, or males living and working outside of the project area such as the interior.

4.4.8 Schools

There are no schools located within the areas targeted for project interventions. However, there are schools located within the wider community. According to the Ministry of Education there are six school listed in the wider communities of the project areas, as is outlined in Table 4-17. In addition, new schools are earmarked for construction, such as a secondary school at Prospect.

Table 4-17: Schools within the Wider Project Area

Number of Schools	School Level	Location
1	Nursery	Peter's Hall
1	Nursery	Providence
1	Primary	Peter's Hall
1	Primary	Providence
1	Primary	Covent Garden
1	Secondary	Covent Garden

Source: https://education.gov.gy/web2/index.php/or/other-files/list-of-schools?filter%5Bsearch%5D=&limit=30

4.4.9 Archaeological and Cultural Heritage

There have been no significant archaeological and other cultural heritage finds within the project sites recorded by the National Trust of Guyana. There is also no know cultural or historical site of significance. Historically, the land was primarily used for the planting and harvesting of sugar cane

and was subsequently designated and diverted to planned housing development by the Government of Guyana. There are no significant cultural and religious values attached to land.

5.0 STAKEHOLDER ENGAGEMENT

5.1 Engagement Approach

Stakeholder engagements were considered as a critical element of the ESA preparation process. Stakeholders were engaged to provide information on the project area and to present any concerns or recommendations they may have regarding the project. Stakeholder engagement for the ESA process is discussed in this section.

Engaging with project stakeholders were done in a transparent, systematic, and non-discriminatory manner which added several benefits to the project. These include but are not limited to:

- Enabling people to understand their rights and roles in relation to the project leading to greater transparency and involvement of stakeholders by enhancing their trust.
- Building the credibility and legitimacy of the institutions involved, whether in an implementing or supporting role.
- Promoting project acceptance, and local ownership, which are key to project success and sustainability.
- Holding stakeholder engagement sessions to identify and assess potential project impacts.
- Having brainstorming sessions to develop measures to mitigate impacts identified by stakeholders.

Stakeholders for the project are diverse and generally, comprise local communities, national, regional, and local government authorities, and civil society organisations. The overall purpose of the stakeholder engagements is to build awareness of the project and provide a platform for stakeholders to share their feedback during the ESA preparation process. The following approach was adopted:

- Inform stakeholders about project and planned project activities.
- Initiate open dialogue between the ESA team and stakeholders to allow stakeholders to receive clarifications on the project, and to share their views, concerns, and expectations.
- Receive feedback from stakeholders on the main environmental and social concerns associated with the project for inclusion and consideration in the ESA.
- Create a mechanism through which feedback from stakeholder engagements are shared with the CHPA to ensure that stakeholder engagements are meaningful and are considered in decision-making.

The engagement approach builds on the numerous engagements held by CH&PA with the project stakeholders that were critical to project design. The primary stakeholders engaged were drawn from the communities which fall within the project's area of influence, which are the communities which would benefit from the works to be conducted as part of the project. These communities are:

1. Peters' Hall
2. Providence Phase 2 (North and South)
3. Perseverance
4. Herstelling
5. Farm (Phases One and Two)
6. Covent Garden

The primary and secondary stakeholders are identified from within these communities and from its administrative bodies. The Population and Household Census 2012 shows that the communities combined has a total population of approximately 6,308 thousand people, with a total household count of 2,060 thousand. At the time there was no population data available for Perseverance. However, since 2012 there has been significant development in the housing sector, with the opening up of new phases and housing schemes within these areas, as well as the occupation of lots. As a result, there is expected to be a significant increase in population and household within these communities. Some of these areas also has a low occupancy due to the lack of adequate infrastructure, and as such, there is expected to be a significant increase in occupancy once there is sufficient access and other infrastructural works.

The success of the public engagement of the project stakeholders was rooted in honest, open, and meaningful dialogue early and often throughout the course of a project. Some elements of this process are provided below but not limited to:

- Joint identification by community representatives and CHPA of all stakeholders who could have an interest in the project.
- Allowing community members to identity their priority issues to be addressed by developmental projects.
- The early engagement and meaningful integration of community leaders into the project's purpose, need, and benefits, and provision of frequent updates as the project progresses.
- Meeting with project-affected communities in appropriate forums and using suitable methods to better understand local, context-specific issues and demonstrate a commitment to public involvement.
- Providing adequate notice of all public meetings and other such public outreach efforts being sensitive to cultural norms of the diverse housing communities.
- Providing stakeholders with the appropriate grievance mechanism to seek remedy if the project causes harm to them or the environment.
- The developing of a database of stakeholders that will continue to be updated as additional stakeholders are identified.

During the consultation process, stakeholders were engaged to provide information on the project area and to present any concerns or recommendations they may have regarding the project. Stakeholder engagements were considered as a critical element of the ESA preparation process. Stakeholder engagement supported the identification and assessment of potential impacts and the development of measures to mitigate these impacts. Stakeholder engagements also served to familiarize local and central stakeholders of the project's activities, the measures being undertaken to protect the environment and people, to provide a platform for concerns to be raised and to lay the foundation for a positive relationship between the project and the community. It also allowed for gathering of information about the socio-economic structures of the communities and provided information on the advantages and disadvantages that may be derived from the implementation of the project.

5.2 Stakeholder Identification and Characterization

Identifying the stakeholders and groups of stakeholders who should be consulted was done early in the ESA preparation process since a Stakeholder Engagement Plan for the ESA was required to be submitted as part of the Scoping Report. According to the IDB this Category B program will have short lived negative environmental and social impacts with low project risks. With a multitude of

options for categorization for stakeholders it was determine to maintain the objective of simplicity by not overly complicating a lower-risk project.

Stakeholder were identified and grouped according to two categories – primary and secondary stakeholders.

Primary stakeholders are stakeholders that would be the key beneficiary of the project, and those that the project is likely to impact directly or whose decisions may impact the project directly. These include residents, community leaders, local administrative bodies and local businesses. The primary stakeholders engaged were drawn from the communities that have been identified for project intervention.

Secondary stakeholder are stakeholders that will be impacted indirectly by project activities or those that have interest in the areas and project. These are primary service providers and other decision-making bodies. Other secondary stakeholders, such as community development group, community policing group, and local administrative bodies were identified as secondary stakeholders to ensure that administrators of the various community bodies are properly consulted and feedback recorded.

Vulnerable groups are physically, mentally, or socially disadvantaged persons who may be unable to meet their basic needs and may therefore require specific assistance and were therefore considered as part of the stakeholder engagement process. These groups of people require specific facilities to reduce or eliminate potential impacts and may have specific requirements during the construction and operation phase of the project. While no vulnerable groups were determined to be present within the project area during the scoping exercise, the National Commission on Disability and the Ministry of Human Services and Social Security were consulted during the stakeholder engagement process given their unique disposition.

A stakeholder matrix is included in Annex 2-B which outlines the stakeholder, their association with the project area, and contact information. This matrix allows for the identification of stakeholders from each community within the project area, including residents, community groups, business, and administrative groups such as Neighbourhood Democratic Councils and Community Development Councils.

The identified stakeholders and their relevancy to the project are outlined in Table 5-1. Table 5-2 presents the key stakeholders identified.

Table 5-1: Stakeholder Classification and Relevancy

Stakeholder Classification	Stakeholder	Relevancy
Primary Stakeholder	Residents	These groups of people are directly impacted by the project activities and are the primary beneficiaries of the project
	Community Development Groups	
	Local Businesses	
	National Commission on Disability Ministry of Human Services and Social Security	Vulnerable groups may be directly and indirectly impacted by the project activities during both the construction and post construction phases.
Secondary Stakeholder	Guyana Telephone and Telegraph Company	These groups of people are indirectly impacted by the project activities and are the secondary beneficiaries of the project
	Guyana Power and Light Company	
	Guyana Water Inc.	
	Neighbourhood Democratic Council	

Table 5-2: Stakeholder Identification

Stakeholder Classification	Stakeholder Entity	Contact Person
Primary Stakeholder	Residents	Random Selection
	Local Business	Random Selection
	Ministry of Human Services and Social Security/National Commission on Disability	Ms. Hamwanttie Bisesar – Director of Social Services, Ministry of Human Services and Social Security
	Providence Community Group	Kevin Williamson – Chairman
	Peter's Hall Community Group	John Hernandez – Member
	Perseverance Community Group	Alicia Samaroo – Chairman
Secondary Stakeholder	Guyana Telephone and Telegraph Company	
	Guyana Power and Light Company	Gary Hall, Divisional Director Safety, Health, Environmental Management and Operational Support
	Guyana Water Inc.	Curtis Niles – Manager, Region 4
	Herstelling/Little Diamond NDC	Puneet Jaigopaul, Chairman
	Eccles/Ramsburg NDC	Anand Kalladeen, Chairman
	Eccles/Ramsburg NDC	Ramesh Persaud Vice Chairperson

5.3 Engagement Methodology

Engagement with project stakeholders including residents was conducted by the Consultant and CHPA individually and on separate occasions, and the feedback from these engagements were

shared with each other. This assisted in identifying the key project stakeholders, as well as identifying possible environmental and social impacts and determining appropriate mitigation measures.

Before the inception of the ESA process and during the identification of project areas, CHPA informed the members of the community about the project activities and expected project outcomes by distributing information sheets, flyers, and project notices to members of the community. Additionally, a project information booklet was prepared and distributed to residents and groups within the community. This information booklet contained detailed information of the project components, scope of work, project activities, maps of project areas, and contact information for project staff should the stakeholder have additional questions or queries. The handbook was available and was distributed at least a month before consultations were conducted. A sample of the project information handbook is included in Annex 2 – C.

During this exercise, residents were informed by public notices, fliers, and word of mouth that there will be subsequent engagement by the consultants during the course of the stakeholder consultation period. This served as an effective method of providing adequate information on the project activities and expected outcomes so that residents were prepared and are able to provide useful feedback. A sample of the public notices and fliers are included in Annex 2 – F.

Stakeholders identified as primary stakeholders and key beneficiaries were consulted using face to face consultation by random selection. The consultant visited the project areas and randomly called on residents that were at home at the time. Upon their availability, an oral presentation was made to the resident and feedback was recorded along with other relevant contact information.

There were two stakeholder meetings that were conducted by the CHPA where the project affected parties (PAPs), and primary and secondary stakeholders were invited to participate in the sessions aimed at informing them of the project components and other project related activities and to gather feedbacks and recommendations for the project. A summary of these engagements is provided in Annex 2 – E.

For residents and other PAPs whom may have not been able to attend the stakeholder meetings or face to face interviews, an alternative feedback instruments were provided. Interview sheets were prepared and distributed to the stakeholders by hand. They were then given two weeks to complete the interview sheet and return it by hand or email. This instrument was proven effective since it allowed residents and other PAPs adequate time and privacy to complete the interview sheet with the required information, and feedback. A sample of the interview sheets are included in Annex 2 – D i and ii.

These exercises were done on the weekends so that the consultations would capture both the working and none working residents. All of the residents contacted were willing to engage with the Consultant during the site visits. There was no need for call backs or further consultations since there was adequate information provided during the face-to-face consultation method.

In addition, information and other feedback from the consultation conducted by CHPA was shared with the Consultant. This information aided the findings of the ESA by providing additional information and feedback captured by the CHPA's consultations and corroborated the information collected by the Consultant. A summary of the engagements conducted by the CHPA is presented in Table 5-4. Supporting information such as prior information provided, etc. are included in Annex 2.

For businesses within the area the same approach and technique was utilised as was used for the residents.

Other primary stakeholders, such as community development groups and local administrative bodies were contacted by phone prior and were asked to provide a convenient time and method of engagement with each body. These stakeholders suggested that the consultation be done via telephone calls, so that there is an efficient relay of information. The advantage of individual consultations was that each stakeholder was able to be present and was able to provide adequate information during the time slot allocated for each stakeholder.

Secondary stakeholders were engaged via telephone calls. This ensured the most effective use of time and provided a convenient option for busy stakeholder to participate in.

Table 5-3: Stakeholder Engagement Methods

Stakeholder Classification	Stakeholder	Engagement Method	Justification
Primary Stakeholder	Residents	Face to Face	Allow for residents to be engaged in the comfort of their surroundings and ensured that the information was captured in a comprehensive manner. This also enabled the Consultant to make observations of the surroundings. Some communication services such as internet and land line telephone services are not available in most areas, and as such, residents were more inclined to be engaged face to face since other methods would require that making an additional effort and incur expense.
	Local Business	Face to Face	Allow for businesses to be engaged in the comfort of their surroundings and ensured that the information was captured in a comprehensive manner. This also allowed the Consultant to assess any impact the project may have on businesses.
	Ministry of Human Services and Social Security/National Commission on Disability	Telephone Interview	Given the busy and hectic schedule, a telephone consultation was conducted to ensure that the consultation was done in an efficient and effective manner.

	Providence Community Group	Telephone Interview	Given the busy and hectic schedule of the stakeholder, a telephone consultation was conducted to ensure that the consultation was done in an efficient and effective manner.
	Peter's Hall Community Group	Telephone Interview	Given the busy and hectic schedule of the stakeholder, a telephone consultation was conducted to ensure that the consultation was done in an efficient and effective manner.
	Perseverance Community Group	Telephone Interview	Given the busy and hectic schedule, a telephone consultation was conducted to ensure that the consultation was done in an efficient and effective manner.
Secondary Stakeholder	Guyana Telephone and Telegraph Company	Telephone Interview	Given the busy and hectic schedule, a telephone consultation was conducted to ensure that the consultation was done in an efficient and effective manner.
	Guyana Power and Light Company		
	Guyana Water Inc.		
	Herstelling/Little Diamond NDC		
	Eccles/Ramsburg NDC		

Table 5-4: Summary of Stakeholder Engagement Activities

Date	Time	Activity	Venue	Purpose of Meeting
November 19th, 2022	9:00am-4:30pm	Community Wide Consultation Face-to-Face	Peter's Hall Primary School	In accordance with the Stakeholder Engagement Plan for GY-L1031, a public consultation was held with the residents, of the above-mentioned preselected communities in relation to infrastructure works to be executed at the third project site along the East Bank Demerara corridor, under the AHUAP. The objective of the consultation was to provide information, answer questions, explain the potential impacts and mitigation measures of the project and obtain stakeholders input on issues and concerns to be addressed in project development, planning and implementation.
November 26th 2022	1:00pm-5:30pm	Women's Safety Audit Face-to-Face	Perseverance Community Playground	In accordance with the Stakeholder Engagement Plan for GY-L1031: A Women's Safety Audit (WSA) was conducted under the AHUAP to give the women living within Perseverance the opportunity to map and assess the safety of existing public spaces with the objectives of informing the design and construction of future community facilities and infrastructure in their community.
January 28th 2023	9:00am- 4:00pm	Community Wide Consultation (Distribution of Information Booklet and Response for residents and organized groups)	Field based	Modified Approach for Community Wide Consultation for Peter's Hall (Phase 1), Providence (Phase 2 [North and South]), Farm (Phases 1 & 2) and Covent Garden This initiative was geared at disseminating information on the project through the distribution of an information booklet which includes the following topic areas: an overview of the Core Home Support and Home Improvement Subsidy, Project Scope of Works, and Environment and Social Safeguards Management.

				Additionally, a response sheet was also distributed to obtain the residents feedback on issues, concerns and recommendations as it relates to the implementation of the project within their area
February 4th, 2023	9:00am- 4:00pm	Collection of response sheet from residents within four housing schemes	Field based	To obtain from the resident's feedback on issues, concerns and recommendations as it relates to the implementation of the project within their area (Peter's Hall Phase 1, Providence Phase 2 (North and South), Farm Phases 1 & 2 and Covent Garden).
February 11th, 2023	1:00pm-5:30pm	Women's Safety Audit Face-to-Face	Providence Phase 2 (North and South) GWI Well Site	In accordance with the Stakeholder Engagement Plan for GY-L1031a WSA was conducted under the AHUAP to give the women living within Providence Phase 2 (North and South), the opportunity to map and assess the safety of existing public spaces with the objectives of informing the design and construction of future community facilities and infrastructure in their community.
March 4th, 2023	1:00pm-5:30pm	Women's Safety Audit Face-to-Face	Covent Garden (North and South) Road reserve behind Lot 857 Covent Garden	In accordance with the Stakeholder Engagement Plan for GY-L1031 a WSA was conducted under the AHUAP to give the women living within**.** Covent Garden, the opportunity to map and assess the safety of existing public spaces with the objectives of informing the design and construction of future community facilities and infrastructure in their community.
March 11th, 2023	1:00pm-5:30pm	Women's Safety Audit Face-to-Face	Farm Phases 1 and 2 (Cul-de-Sac from Lot 1783-1785	In accordance with the Stakeholder Engagement Plan for GY-L1031 a WSA was conducted under the AHUAP to give the women living within Farm Phases 1, the opportunity to map and assess the safety of existing public spaces with the objectives of informing the design and construction of future community facilities and infrastructure in their community.

April 15th, 2023	1:00pm-5:30pm	Women's Safety Audit Face-to-Face	Peter's Hall phase 1 (Peter's Hall Primary School)	In accordance with the Stakeholder Engagement Plan for GY-L1031 a WSA was conducted under the AHUAP to give the women living within Peter's Hall (Phase 1) the opportunity to map and assess the safety of existing public spaces with the objectives of informing the design and construction of future community facilities and infrastructure in their community.
April 29th, 2023	1:00pm-5:30pm	Women's Safety Audit Face-to-Face	Herstelling Plot C (Parcel 2219) Herstelling Plot C Community Playground)	In accordance with the Stakeholder Engagement Plan for GY-L1031 a WSA was conducted under the AHUAP to give the women living within Herstelling (Plot C) the opportunity to map and assess the safety of existing public spaces with the objectives of informing the design and construction of future community facilities and infrastructure in their community.

5.4 Documentation of Engagement Process

Feedbacks were recorded during the consultations and permission was requested from the stakeholders for photographs to be taken to further documentation of the process, as can be observed in Figure 5-1. In consideration of the COVID-19 safety protocols, face to face consultations were done in a safe and respectful manner. A detailed report of the consultations was prepared for inclusion in the ESA and is included as Annex B. A summary of the feedback received is presented Section 5.5.

Figure 5-1: Stakeholder Engagement Activities

5.5 Stakeholder Feedback

Minutes and feedback of the consultation were taken and a summary is presented in the Annex 2-A. Feedback received from previous engagements conducted by CHPA were also taken into consideration in the impact assessment and mitigation planning for the project. These are summarised in Annex 2-E.

5.5.1 Primary Stakeholder

The primary stakeholder consulted are in support of the project and are eager to have the project completed soonest. It was noted that the rehabilitation of the roads, construction of drains, and installation of street lights in some areas will have a number of advantages such as improved access, less vehicle damage, proper drainage, increase the property value, encourage other land owners to build and move into the community, and aid in other business ventures.

Additionally, there is a need for street names, speed bumps, and adequate road marking once the road is completed so that persons may be able to identify the areas properly and limit the speeding by vehicles that may cause accidents and other damages to the road and utilities.

Stakeholders are hopeful that the rehabilitation of the road may reduce flooding of the road and less holes with water making it easier for pedestrians, especially school children to use the road. Further, this improved access may enable other persons to own low-cost vehicles such as cars, since at present some cars cannot access the streets. This will help residents to be more efficient and independent.

Stakeholders expressed gratitude that they were included as part of the process from the inception by being consulted and being able to provide feedback and other valuable information about the project sites. The inclusivity is important since residents will be directly affected by the project and are also the primary beneficiary of the project.

While residents acknowledge that there will be temporary negative impacts from the project such as dust and noise pollution, blocking of roads and other access points, and that they may be required to use an alternative access road, residents acknowledge that these are temporary and unavoidable impacts, and that they are willing to be uncomfortable for a short period of time, so that they can have better roads and other community facilities.

Other concerns raised during the consultation was the quality of the water received by the residents. Residents note that the water quality is high in iron content and as such, cannot be used for some domestic and household use. Residents have resorted to storing rain water in tanks and other reservoirs.

5.5.2 Secondary Stakeholders

This stakeholder group was mostly aware of the project, but require more information on the design and the technical specifications of the project to properly provide specific feedback. However, based on the discussion during the consultation, they offered some general feedback based on previous experience with rehabilitation of roads within communities.

They noted that generally, especially within planned communities such as in these project areas, provisions are made for the construction of roads, installation of drains, pavements, and other utility services. As such, there is expected to be minimal damages to the current infrastructure. However, some disruption of services may occur during the construction phase.

There are likely to be some damages to property during the construction phase, such as damages to main water lines, heavy duty equipment cutting power lines and other service lines, and in some rare but likely cases of the relocation of electrical poles. In this case, the CHPA and the contractors

would need to properly coordinate with the utility providers to ensure that all damages are reported immediately so that they can fixed and residents are not inconvenienced furthered.

This stakeholder group were aware that the project will have a positive impact on the community leading to increase demand for services.
The NDCs reported that the project areas are still to be handed over to them and therefore they do not have oversight of the administration of the communities. They noted that the handing over of the communities would create opportunities for the communities by ensuring certain services are provided that are offered by the NDCs. Further, the communities' concerns would be represented at meetings and addressed by the relevant authorities. The NDCs were happy to learn of the development within the area and wanted that ensure that more community roads would be upgraded to the benefit of all road users.

A summary of the feedback provided by stakeholders is presented in Table 5-4.

Table 5-5: Stakeholder and Feedback Summary

Stakeholder Classification	Stakeholder Groups	Feedback Summary
Primary Stakeholders	Residents Ministry of Human Services and Social Security Community Development Committees Local Business	- Need for street names, speed bumps and road markings. - Improvements will: • allow for better traffic flow • result in lower maintenance cost for the vehicles • increase occupancy within the area • eliminate flooding of the streets caused by potholes • make pedestrian use of the roads easier and safer • contribute to a better flow of traffic • allow for establishment of business and other services that the community needs • allow more foot and vehicle traffic to businesses within the community - Noise and dust pollution are likely not to affect the residents since works will be temporary
Secondary Stakeholders	GWI GPL GTT Neighbourhood Democratic Councils	- Planned communities and housing development makes provision for road infrastructure - Likely to have some disruption of services or damages to lines during construction phase. - Project areas are not within the purview of NDCs

6.0 ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT

6.1 Identification and Evaluation of Key Environmental and Socio-economic Aspects

Geographically, the project spans several communities along the East Bank Demerera between Peter's Hall to Covent Garden. These communities include Peters Hall, Providence (Phase Two North and South), Perseverance, Herstelling, Farm (Phases One and Two) and Covent Garden. However, the works that are to be undertaken are sparsely dispersed between these six communities. In addition, the interventions will be done within existing CHPA housing schemes, where the project environment is already impacted from the ongoing development of these schemes and subsequent four-lane highway construction which runs through most of these communities. The roads and drains to be upgraded as part of the project are already in place.

An evaluation of the project and its impacts on these communities, and the general environment was conducted based on reconnaissance done during field exercises. The process utilised for the identification and evaluation of key environmental and socio-economic impacts was done in accordance with the IDB approved Environmental and Social Screening Checklist as outlined in the ToR, and included in Annex 1. Literature review of projects that were similar in nature also played a significant role in determining potential impacts. Based on the evaluation, it was predicated or envisaged that the project will have some amount of impacts on the physical, biological and socio-economic environments.

Impact identification and evaluation was conducted by a rigorous systematic approach and included:

- Characterizing the baseline conditions of the project area to establish and assess the most current and potential environmental effects of the project;
- Identifying the source of impacts and the impacts themselves that are being or are likely to be generated by the project. This was achieved through professional judgment, field work, desktop analysis and review of relevant literature;
- Rating impacts to determine impact significance. This was achieved through the guidance of the Environmental and Social Checklist which was instrumental during the field exercises;
- Evaluation of impacts after considering mitigation measures; and
- Evaluation of long-term impacts which are likely to occur during the operational phase.

The impacts were assessed based on the project environment and the activities to be conducted as part of the project. For each impact, the following were taken into consideration:

- Whether the impact is localised or extensive;
- Whether it is short term or long term;
- Whether it is a positive (+) or negative (-) effect;
- Whether the intensity and magnitude is high (H), medium (M) or low (L)
- Whether it is avoidable or unavoidable;
- Whether it is significant or insignificant; or
- Whether it is mitigable or unmitigable.

The following subsections will elucidate on the foreseen impacts on the physical, biological and socio-economic environment.

6.1 Physical Environment

6.1.1 Air Quality

Dust and other air emissions at the construction sites can negatively impact air quality and adversely impact the health of construction workers and neighbouring receptor properties. Based on an appraisal of all the activities that are to be conducted during the construction phase and those which are likely to occur during the operational phase of the project, it is anticipated that there will be emission related impacts to the air in the form of dust and combustion gases. During the construction phase, these impacts are likely to be more significant, but short term and localised. The intensity and magnitude of these impacts are likely to be low due to the dispersion of works and the fact that the impacts are mitigable. These impacts are also expected to continue for a period after construction, since the project itself would create a positive effect on the socio-economic environment of these communities, which would likely spark an increase in private construction, hence further increasing the rate of occupancy.

Dust

Given the nature of the main and supporting activities that are to be performed during the execution of works or the construction phase, it is anticipated that there will be emissions to the air in the form of dust/particulates. The mobilization of equipment and machinery at the project sites could generate dust emissions mostly during the construction phase as vehicles and machinery excavate and traverse the site. However, most of the project sites are located within proximity to large open spaces and unoccupied lands, which is some cases, reduces the likelihood of this impact being high. Nevertheless, dust and associated impurities are injurious and irritating to people and animals. Dust emissions soak and contaminate clothes, property, and vegetation.

The expected impact during construction is of low intensity; occurrences are localized, with a low magnitude. These emissions are likely to continue after construction since the new infrastructural developments are likely to increase socio-economic activities within the various communities. Several sources of dust emissions have been identified and are presented in Table 6-1 below.

Table 6-1: Emissions to the Air: Dust/Particulates

Phase	Type of Dust Emission	Emission Sources	Effect (+/-)	Intensity (H/M/L)	Magnitude (H/M/L)
Construction Phase	Fugitive dust and other particulate matter.	Vehicles and heavy-duty equipment kicking up dust while traversing roadways during dry conditions, particularly, when transporting materials, equipment, spoils/waste to and from the various projects sites.	-	L	L
		Land clearing activities, particularly in areas with thick vegetation along the road shoulders.	-	L	L

Phase	Type of Dust Emission	Emission Sources	Effect (+/-)	Intensity (H/M/L)	Magnitude (H/M/L)
		Excavation works, for example: clearing of canals, drains and culvert sites.	-	L	L
		Grading of roadways and walkways.	-	L	L
		Building of Road Shoulders	-	L	L
		Offloading of materials such as sand, loom, stones, cement and wood.	-	L	L
		Sawdust produced during the cutting of wood for construction uses.	-	L	L
		Removal of form works, particularly during the construction of culverts and sidewalks.	-	L	L
		Construction activities involving masonry works, particularly during loading and operating cement mixers.	-	L	L
Post Construction Phase	Fugitive dust and other particulate matter.	Increased traversing of vehicles and trucks along roadways during dry conditions.	-	L	L
		Trucks transporting materials for private construction.	-	M	M
		Building materials such as sand and stone for housing construction being dumped along roadways uncovered for long periods.	-	M	M
		Sawdust from offloading and cutting of wood for housing construction.	-	L	L
		Masonry activities, particularly during operation of cement mixer and removal of formworks during private construction works.	-	M	M

L – Low M – Medium H - High

Gaseous Pollutants

Gaseous emissions such as Carbon monoxide (CO), Hydrogen sulfide (H2S), Nitrogen dioxide (NO2), volatile organic compounds (VOCs), and particulate matter (PM) are expected to be generated from the machinery operating within the project sites during construction. Also, fumes from construction equipment and the generator can affect the air quality within the various project areas. However, it is anticipated that this impact would be minimal. Due to the scale and localized nature of the projects and the small number of heavy equipment to be used, combustion emissions will be minimal and will result in insignificant impacts.

These emissions are likely to continue after construction is completed since the new infrastructural developments are likely to increase socio-economic activities within the various communities. Several sources of gaseous pollutants have been identified and are presented in Table 6-2 below.

Table 6-2: Emissions to the Air: Gaseous Pollutants

Phase	Type of Gaseous Pollutants	Emission Sources	Effect (+/-)	Intensity (H/M/L)	Magnitude (H/M/L)
Construction Phase	Combustion Gases (CO, CO_2, SO_2, NO_x, N_2O, VOCs or HCs.)	Combustion of fossil fuels during the operation of generators, water pumps and heavy-duty equipment such as excavators, bull dozer, non-vibratory soil compactor, trucks, rollers and cement mixers.	-	L	L
Post Construction Phase	Combustion Gases (CO, CO_2, SO_2, NO_x, N_2O, VOCs or HCs.)	Combustion of fossil fuels by vehicles traversing the area and by equipment used in construction of buildings.	-	L	L

L – Low M – Medium H - High

6.1.2 Noise and Vibration

Throughout the construction phase, sources of noise may occur from, trucks carrying construction materials to the site, and removing construction waste from the site. In addition, the use of construction machinery and equipment would generate noise among other activities such as excavating, rolling and compacting. Therefore, workers and members of the community may be exposed to high noise levels during this phase.

In conjunction with noise, vibrations are expected to arise from vehicles carrying construction machinery and materials to and from the various sites, from the operation of heavy construction machinery, particularly compactors. It is expected that construction activities will be limited to normal work-day hours.

Noise levels above the alert threshold of 86 decibels and hazard threshold of 95 decibels will be considered a nuisance and would therefore have significant negative effects on both construction workers and nearby receptors such as residents. It is anticipated that there will be an increase in noise level throughout the duration of the project. The main sources are likely to be from the use of generators, heavy duty equipment and manual and electrical hand tools. It is envisaged that the potential impacts of noise nuisance will be localised and short term, but could be significant if it exceeds the prescribed levels for long periods.

Exposure to noise levels above the internationally accepted level of 90 decibels can cause noise induced hearing loss. Noise levels above the tolerable threshold of 72 decibels can result in fatigue, tiredness, low morale and decreased productivity. Heavy-duty equipment and generators in particular, usually generates significant levels of noise. However, rehabilitation and construction within these communities are well dispersed and will therefore not have cumulative effects. Nevertheless, measures should be implemented to keep noise levels within the Guyana National Bureau of Standards (GNBS) prescribed limits for construction sites, which is 90 dB during the day and 75 dB at nights.

High levels of noise and vibration are also expected to continue post construction since the new infrastructural developments are likely to increase socio-economic activities within the various communities. This increase is also expected to be short term with little significance. Several sources of noise pollutants have been identified and are presented in Table 4-3 below.

Table 4-3: Noise Emission and Vibration

Phase	Emission Sources	Effect (+/-)	Intensity (H/M/L)	Magnitude (H/M/L)
Construction Phase	Operation of generator and water pumps	-	M	M
	Heavy duty equipment	-	M	M
	Manual and electrical hand tools	-	L	L
	Operation of soil compactors/vibrators	-	L	L
Post Construction Phase	Heavy duty equipment used	-	M	M
	Operation of generator	-	M	M
	Manual and electrical hand tools	-	L	L

L – Low M – Medium H – High

6.1.3 Water Resources

Surface Water

The project is anticipated to have some amount of impacts to surface water quality. These impacts are foreseen to be both positive and negative. Activities such as, excavation of earthen drains and canals and temporary construction of cofferdams during culvert construction could result in changes to the quality of surface water within these communities. This could be exacerbated during periods of heavy rainfall due to erosion. Eroded materials can be transported into the waterways via surface runoff and can increase the turbidity of surface water bodies and at the same time result in sedimentation and discolouration. This can ultimately have impacts on the productivity of the

aquatic environment and at the same time impacts on the aquatic life, fishes especially. However, while these impacts are possible, it should be noted that the current condition of the drainage networks, which accounts for the main surface water bodies within these communities, is currently deplorable and in some cases non-existent, due to heavy siltation and vegetative growth. In some cases, the drains are used as dumping grounds for domestic garbage. In this regard, the project will have a positive impact on the surface water quality, particularly activities which involves re-establishing the drainage networks within these communities. Thus, the potential issues of sedimentation and increased turbidity is expected to be short term and not anticipated to be a likely significant impact.

There is the likelihood that there will be waste disposal issues which can compromise the existing quality of surface water within the various communities. Improper management of waste, including both solid and liquid waste can affect water quality. Solid waste can often end up in water bodies as a result of direct dumping or through indirect means hence, resulting in contamination and blockages.

During the construction period there will also be effluent or liquid waste, particularly blackwater and greywater which will be produced from temporary office and housing facilities established by contractors. If these are allowed to drain directly into the nearby waterways, it can have negative effects on the water quality. This impact is also likely to intensify during the operational phase, as the development will motivate persons who have not yet occupied their lands to do so.

Fuel and waste oil, if not properly managed and handled can accidentally spill and result in direct or indirect water contamination. Water can also be contaminated from fuel and waste oil through leakage of storage containers and improper handling practices. Improper disposal of waste oil and other hazardous waste can result in contamination. Therefore, it is necessary for measures to be implemented to prevent this occurrence, especially taking into consideration the soil type, which would allow for the material to be dispersed easily. However, it is not expected that significant amount of waste oil and other hazardous waste will be generated during both construction and operational phases.

The likely sources of these impacts been identified and are presented in Table 6-4 below.

Table 6-4: Impacts to surface water

Phase	Type of Impacts	Sources	Effect (+/-)	Intensity (H/M/L)	Magnitude (H/M/L)
Construction Phase	Sedimentation, discolouration and increased turbidity.	Excavation works	-	M	M
		Drainage cleaning	+	M	M
		Stockpile materials (Sand, loam and stone)	-	L	L
		Spoils	-	M	M
		Construction of cofferdams.	-	M	M
	Contamination	Dumping of Solid and liquid waste (blackwater and greywater)	-	L	L

Phase	Type of Impacts	Sources	Effect (+/-)	Intensity (H/M/L)	Magnitude (H/M/L)
		Spilling of fuel, waste oil or any other such liquid wastes that are hazardous	-	L	L
Post Construction Phase	Sedimentation, discolouration and increased turbidity.	Land clearing	-	M	M
		Stockpiling building materials.	-	M	M
	Contamination	Dumping of Solid and liquid waste (blackwater and greywater)	-	H	H

L – Low M – Medium H - High

Ground Water

A project of this nature could have significant negative impacts on groundwater resource, since there is a high probability of construction works causing damages to underground mains which provides potable water to residence within these communities. In such cases, pipelines which becomes damaged or broken will create entry points for a host of contaminants which during low pressure could be fed back into the aquifers. Such occurrences will be even more prevalent if there is a need for relocating water distribution lines within the selected communities, particularly for the construction of culverts. This could therefore compromise the quality of groundwater within the area, hence creating negative long-term impacts that are specific to human. While there is a high possibility of this impact occurring, it should be noted that such an issue currently exists in each of the selected communities within the project area and to a larger extent, external communities. In fact, it is common to find existing leaks throughout these communities. This issue could be worsened if spills of hazardous material occur within proximity to breakage or leaks.

Table 6-5 provides the likely impacts to groundwater and the subsequent sources.

Table 6-5: Impacts to Groundwater

Phase	Type of Impacts	Sources	Effect (+/-)	Intensity (H/M/L)	Magnitude (H/M/L)
Construction Phase	Contamination through broken water mains.	Dumping of Solid and liquid waste (blackwater and greywater)	-	L	L
		Spilling of fuel, waste oil or any other such liquid wastes that are hazardous	-	L	L
Post Construction Phase	Contamination through broken water mains.	Dumping of Solid and liquid waste (blackwater and greywater)	-	H	H
		Spilling of fuel, waste oil or any other such liquid wastes that are hazardous	-	H	H

6.1.4 Geology and Soil

The project is not foreseen to have any significant impacts on the geology of the communities selected for intervention, since all rehabilitation works will be carried out on existing infrastructure, rather the construction of new one.

Potential impacts to the soil and topography could result from soil excavation works and site preparation for the project, including earthworks associated with construction. Soil erosion could result from earth works associated with the removal of existing vegetation, grubbing, grading and levelling of the site. The removal of vegetation will expose unconsolidated topsoil to erosion elements, which could result in the washing of nutrients contained in soils. The erosive processes also degrade the remaining soil, decreasing its fertility and productivity. Eroded soil may cause vegetation regeneration to be difficult in affected areas and may ultimately affect landscape replanting within the site. Unchecked soil erosion could also lead to excess sediment discharge to the receiving drains, which has the potential to reduce water quality as well as impede the drainage flow within site drains. Soil erosion impacts are however, anticipated to be minor (small magnitude, low sensitivity) as a consequence of the cohesive nature of the clay soils of the site.

During the construction phase the use of oils and fuel by vehicles and construction machinery and the generation of waste oil from equipment maintenance have the potential to cause soil contamination in the event of accidental leaks or spills.

6.1.5 Landscape

Given the current condition of the roads selected for intervention, it is envisioned that the project will have positive impacts on the landscape of the various communities, rather than negative impacts. Once completed, the project will significantly enhance the aesthetics of communities selected for intervention. Overgrown vegetation and garbage dumped along the shoulders of the roads will be removed and levelled smoothly to accommodate pedestrian accesses. Stagnated earthen drains will be cleaned and established to allow continuous flow of water, while street lights will improve visibility during the night, hence providing a safer landscape within the various communities. The rehabilitation and upgrade works will also present a cleaner and healthier landscape that is likely to encourage joggers and cyclists which contributes to health improvements.

Ultimately, enhancements in the aesthetics and safety of these communities have the potential to impact property value positively, while increasing the occupancy rates within each of the selected communities.

6.1.6 Drainage

The project is anticipated to have some amount of impacts to drainage within the targeted communities. These impacts are foreseen to be both positive and negative. Activities such as, excavation of earthen drains and canals and temporary construction of cofferdams during culvert construction could result in blockages and reduced flow. This could be exacerbated during periods of heavy rainfall due to erosion. Eroded materials can be transported into the waterways via surface runoff and can result in increased sedimentation. However, while these impacts are possible, it should be noted that the current condition of the drainage networks is currently deplorable and, in some cases, non-existent, due to heavy siltation and vegetative growth. In some cases, the drains are used as dumping grounds for domestic garbage. In this regard, the project will have a positive impact on drainage since all roadside drains where roads are to be rehabilitated will be re-

establishing. The construction of culverts will also add to the improvement of drainage networks within the various communities. Thus, the potential issue of sedimentation is expected to be short term and not anticipated to be a likely significant impact.

6.1.7 Microclimate

The roads to be rehabilitated will be constructed by asphalted concrete which heat absorption rate is higher than that of the land and water body, while the thermal capacity of the asphalted concrete is smaller than that of the land and water body. This means that the roads with asphalted concrete can absorb the solar radiation and cause some amount of temperature increase itself, which will increase the energy consumption of vehicles on the road and affect the outdoor thermal comfort of pedestrians. Nowadays, the construction of roads has become one of the main-reasons for urban heat island. On the other hand, roads provide the broad path for urban ventilation, which makes it an important element for the construction of urban wind corridor.

The nature of the project does not anticipate any significant negative impacts to the microclimate within the various communities, since these communities are already well-established urban areas and any increase in temperature can be eliminated by the ventilation provided by the broad road paths.

6.1.8 Natural Disaster Risks

Guyana's position on the globe, along with its geological characteristics allows it to escape from a wide array of natural disasters that are common to its neighbouring countries, particularly those within the Caribbean Region. Nevertheless, Guyana is vulnerable to flooding, particularly along its coastal region, which is often affected during the raining seasons. Prolong dry seasons are also attributed to droughts in Guyana. The project is therefore vulnerable to both droughts and floods, with the latter being perhaps the most severe.

This risk of flooding is present within the project areas and as such, could present adverse short and long-term impacts during both construction and post construction phases. The project itself can be affected by flooding. Heavy and continuous rainfall during the rainy seasons could significantly impact construction, resulting in flooding of construction sites and damages to project facilities and equipment. This can also delay the completion of the works, thus prolonging the project duration. Construction activities can result in localised flooding in the areas where construction works are being undertaken. Construction activities will result in the blocking of some drains to facilitate works, such as the drain rehabilitation works and the construction of culverts. If alternative drainage is not provided, then localised flooding may occur. Construction materials can also end up in the drains, thus impeding the area drainage. These situations can be exacerbated during the rainy seasons. In addition, construction activities such as excavation could result in environmental impacts that could exacerbate the effects of flooding in the long-term; for example, increased erosion and sedimentation of drainage canals leading to impaired drainage system functioning, potentially causing an increase in inundated areas.

Flooding represents the main adaptation challenge for the project and for Guyana since the coastal areas lie below mean high tide level. However, with appropriate management and adaptation measures, negative impacts could be minimised. As such, the project is not anticipated to worsen or intensify the risk of flooding. Furthermore, residual impacts could be offset by implementing management measures that result in positive impacts such as preventing floods and erosion. It is therefore possible that the project could have a net positive impact on the area with respect to natural

disaster such as flooding, particularly since all roads to be rehabilitated are accompanied with drainage rehabilitation works.

6.1.9 Waste Management

The project will generate waste, which, if not managed properly, can result in soil and water contamination, contribute to ill health, and affect the aesthetic of the general area. Waste piles often present an eyesore and can affect the aesthetic of any environment. The improper disposal of waste, especially kitchen and food waste can result in odour and attraction of vermin. Waste to be generated includes domestic garbage, which usually consists of a mix of bottles, bags, cans, boxes, plant residues, excess food and kitchen scraps and old clothing and paper. These will mainly be generated by construction staff on a daily basis. Liquid waste will also be generated including sewage waste and waste water from bathing and washing. Hazardous waste to be generated includes waste oil, filters and oil containers which if not properly managed can result in water and soil contamination. Construction waste is also expected to be generated in large quantities, particularly from excavation and masonry works, and would include spoils, wood, broken concrete, pieces steel rod, cement bags, etc.

Several categories of waste materials will be generated throughout the project, these of which include the following:

- ***Solid Waste*** **-** Several categories of solid waste materials will be generated during the course of the project. These wastes are identified as vegetation residues: stripped vegetation, trees and roots; construction wastes: formwork, lumber and steel; excavated soil: undesirable materials (spoils) mixed with garbage; packaging wastes: cartons, food boxes and plastics, metals cans and containers; organic wastes: food scraps.

- **Liquid Waste (Effluent) -** Liquid waste to be generated during the project will include blackwater (sewage effluent) and greywater (domestic/non-sewage waste water). This waste type will require proper management measures so as to avoid any significant impact.

- **Hazardous Waste -** Several categories of hazardous waste will be generated during the project that will have to be managed, these wastes include the follows:

    - Waste oil
    - Waste oil filters
    - Lubricants
    - Hydraulic fluids
    - Medical waste from injuries/accidents

The generation of waste is inevitable throughout the life span of the project and as such will require proper management practices. Poor waste management can result in a number of environmental and social impacts. Some of these impacts may include soil and water contamination and ill health through the spread of diseases. Waste piles also often present an eyesore and can affect the aesthetic of any environment. Improper disposal of waste, especially kitchen and food waste can result in odour and attraction of vermin. Domestic waste or garbage are common on a daily basis and can usually consists of a mix of bottles, bags, cans, boxes, styrofoam, plant residues, excess food, kitchen scraps and old clothing.

Impacts regarding waste and waste management could be exacerbated during the operational phase as these areas would become more favourable to inhabit, hence increasing the level of occupancy. An increase in occupancy will inevitably see an increase in all categories of waste, particularly domestic waste and effluents both greywater and black water.

6.2 Biological Environment

Combined, the communities which incorporates the project area portrays a typical urban like setting and has been under human development for decades. Like most urban areas, the biodiversity may not be as diverse as that in rural areas, as such, the project area lacks significant biodiversity (both flora and fauna) and therefore holds little ecological value. There is no species of importance (Rare, Endangered, and Endemic) inhabiting these locations, and there is no area which can be considered a critical habitat. Therefore, adverse impacts on the biodiversity itself is little to none.

In fact, urban wildlife, such as house mice, are synanthropic, ecologically associated with and even evolved to become entirely dependent on humans. Other species simply tolerate cohabiting around humans and using the remaining green spaces and street/garden vegetation as niche habitats, in some cases gradually becoming sufficiently accustomed around humans to also become synanthropic over time.

In some cases, the project will contribute positively to the direct long-term development of existing species, particularly aquatic lives.

6.2.1 Flora

The existing flora within the project surroundings are not likely to be impacted negatively since the area comprises mainly of secondary disturbed vegetation, primarily of common weeds, shrubs, herbaceous plants and small trees. In fact, the flora diversity within the project sites is similar to that of all villages and towns along the Coast of Guyana. It is dominated by many shrubs and grass species such as *Cynodon dactylon* and *Axonopus compressus*, which to some extent have become invasive in nature and resistant to the harshest of human interference. None of the species identified are endangered or are on the International Union for the Conservation of Nature (IUCN) species listings.

While there are no significant negative impacts foreseen as a result of the project, there may have potential positive impacts during post construction as more land owners will be encouraged to build and inhabit the area. Human dispersal of spores, shoots and seeds can spread many of the species identified during the biodiversity assessment throughout the area. In contrast, the project could cause a reduction of the more invasive grass species currently occupying the road shoulders and drains due to land surfaces finally being paved and utilized for building purposes, hence limiting the spread of these species. This will be seen as a positive impact since a reduction in some of the more aggressive weeds could create a conducive environment for other or even newer species to thrive within the area. Further, this could lead to a richer diversity of flora, which may even facilitate a wider diversity of fauna, including arthropods (particularly insects) and birds. The availability of insects will then attract more avian species and some herpetofauna. The arrival of new species, particularly herpetofauna, could serve as important environmental indicator for future projects within the area, since a diverse ecosystem is a sign of a healthy ecosystem. This shift in diversity could also be supported by better drainage of surface water and abundance of soil nutrients due to the reduction of aggressive weed species.

6.2.2 Fauna

The species of fauna observed within the project area, as listed in Section 4.3.4, are not likely to be impacted negatively by the project activities, since these species are typical of areas where human disturbances are frequent and can be found throughout the coastal areas of Guyana. Even though common within the coastal realm, the faunal diversity within the project area is sparse, primarily due to heavy habitat disturbance and the fact that these species are highly mobile species that adapts easily to changing environments. The species observed are also confined to micro-habitats fragmented by urban structures such as the roads, residents, canal and agricultural activities. The avian species observed were transient, with a home range spanning beyond the project site. Additionally, none of the species observed at the project areas are by no means part of any list of important species.

While the project is likely to have no significant negative impacts to the fauna found within the area, the project could result in positive impacts, especially for aquatic life. Clean and wider drains will allow increased drainage capacity and longer periods of flowing water, hence creating more habitat for aquatic lives such as fish, which could be become a source of food and recreation for persons living within the area. The constructed drains, once properly maintained, will be once again free of pollutants such as plastics and other waste materials, allowing species to thrive freely. Domesticated animals introduced during post construction by new residents will add positively to the diversity of fauna within the area. Increased planting of fruit trees and the occasional kitchen garden by new residents could also lead to an increase in avian species for example, *Columbina passerine* and *Pitambus sulphuratus,* as these species will be able to feed on them.

6.3 Socio-economic Impacts

The project areas are located along the East Bank of Demerara, and was primarily used for sugar cane cultivation before it was converted into housing development. As such, the present environment is centered on dwelling and domestic land use. The project is expected to have some short-term negative impacts and long-term positive impacts on the local communities. These are summarized in Table 6-6.

Table 6-6: Potential Socio-Economic Impacts

Phase	Type of Impact	Impact Source	Effect (+/-)	Intensity (H/M/L)	Magnitude (H/M/L)
Construction Phase	Effects on sites of historical, archaeological, or cultural values and introduction of new materials, colours, and shapes	Land Clearing & Construction Work	**-**	**L**	**L**
	Relocation - Loss of Livelihood	Construction Works	**-**	**L**	**L**
	Changes in Land Use	Construction Works			
	Disruption of Services, Infrastructure and Drainage	Construction Works	**-**	**M**	**L**

Phase	Type of Impact	Impact Source	Effect (+/-)	Intensity (H/M/L)	Magnitude (H/M/L)
	Community Wellbeing-Sanitation, Health and Recreation	Construction Works	-	**M**	**L**
	Community Security	Construction Works	-	**L**	**L**
Operational Phase	Physical integration of the housing schemes into the urban fabric	Physical Integration	+	**H**	**M**
		Demand for Infrastructural Services	-	**H**	**M**
		Influence on environmental behaviour	+	**H**	**M**
		Health	+	**M**	**L**
		Road safety	-	**M**	**M**
		Density of land occupation	+	**M**	**L**
		Movement of population in adjoining areas	+	**M**	**L**
		Project beneficiary monthly expenses	+	**L**	**L**
		Property value	+	**M**	**M**
		Productive activities	+	**M**	**L**

6.3.1 Archaeological and Cultural Heritage

As was stated in Section 4.4.9 there have been no significant archaeological and other cultural heritage finds within the project sites recorded by the National Trust of Guyana, nor are there any known cultural or archaeological resources present in the area. The land was extensively used for sugar can cultivation for centuries. The areas identified for project interventions are already disturbed during the construction of the housing scheme. In this regard, no impact to archaeological or cultural resources is anticipated. Nevertheless, a Chance Find Procedure is recommended in the event that there is an encounter with artifacts during the construction works.

6.3.2 Livelihood, Relocation, and Resettlement

Site visits of the project areas suggested that there are no present encumbrances at the areas identified for project interventions, nor are there any facilities including businesses, formal land users/land owners (residential, commercial, or agriculture lands) and informal land users (i.e., squatters and or informal farming areas) which may have to be relocated. This is due to the housing schemes being well designed and laid out, with provisions for access and drainage. There was also no observation of roadside vending, either mobile or semi-permanent structures. However, a few residents have utilized the parapets in front of their residence to plant flowering plants for aesthetic purposes.

The project is also not expected to cause any significant impacts resulting in the loss of income or livelihood. The site visits and consultations revealed that there are only a few businesses located in the project areas including a general store located at Herstelling and a mobile fish and chips van located at Covent Garden. The general store is located within the resident's property, and such the project activity will not cause any damage to the physical structure of the business or loss of livelihood. In fact, the resident during the initial consultation indicated that there will likely be some boost in sale from construction workers. However, there will be some damage to the access bridge of the property during the construction of the road. To prevent any adverse loss of income, temporary access should be provided during the active construction period. A mobile fish and chips van is located within the Covent Garden project site. The works are not expected to result in a significant loss of income for this business since it does not operate with the community itself. The mobile unit is usually taken to different locations at different periods of time to maximize on sale. However, during hours of "rest", the unit is usually parked on the parapet of the residence on the shoulder of the road. The owner and operator suggested that during the construction phase, the mobile unit can be parked at an alternative location to allow easy access. The only a very few minor other businesses given that the area is a developing housing scheme, and there is a restriction on business activities within the housing area. The identified businesses would only need to secure access to and from the area. There is no roadside vending, short drop taxi service, or other businesses that would require prolonged access to the active construction zones. As such, only the provision for alternative access points to the residences and alternative routes to the project areas are needed at this time. However, if during the implementation phase of the project there are cases that have emerged, or if there is a specific grievance received to this effect, the affected party should be engaged and the mitigation measures implemented.

Given that no significant loss of livelihood is envisaged, the preparation of the Livelihood Restoration Plan (LRP) is not required. However, the CHPA is in the process of preparing an LRP in order to outline a process in the case that there is some livelihood restoration required or a grievance received from stakeholder. In this case, any reported loss of income from businesses should be accounted for in the Entitlement Matrix, after a process of assessment and verification. Currently no case of significant loss of income was identified. However, if during the implementation stage there are cases that have emerged or if there is a specific grievance received to this effect, the LRP will be updated to reflect the information and the affected party will be consulted before any mitigation measures are implemented.

Minor damages to some existing infrastructure installed by residents such drains, bridges, parapets, and fences may be unavoidable during the construction phase. However, new and improved infrastructure are accounted for in the project design which will result in a more efficient drainage and better access. Damaged access such as bridges will be rebuilt or retrofitted in keeping with the Entitlement Matrix of the project.

6.3.3 Land Use

The project is focused on the rehabilitation and enhancing of existing infrastructure and is therefore not expected to cause any disruption or deviation of present land use of the identified areas. In this context, there will be no loss of property or the need for land acquisition under the project.

Similarly, the initial scoping visits suggest that there are no agricultural lands (formal or informal) or squatting at the areas identified for project interventions. It is expected that minor inconvenience to residents using the roads will occur during the construction phase. This is expected to be

temporary, and should be mitigated by the identification of alternative routes before the construction phase begins. Given that works will only be done on selected roads within the communities, most of the other roads will remain usable to provide access. Measures which can be considered to ensure access is maintained can include:

- Moving the bridge/gate to another location in the yard so that residents may not have to use their regular access point which maybe in an active construction zone.
- Road networks can be mapped up to show where there are active construction zones, interconnected roads and suggested routes during active construction. This map should be accessible for download from the CH&PA website and other social media accounts. It should also be printed and shared with members of the communities who may be affected.

It was observed that the project areas are located next to or in close proximity to community centers and green spaces, this would encourage a healthier lifestyle if people are able to access the community ground easier. Additionally, the upgrade is expected to encourage occupancy of the area by proving easier access once completed, as it was observed that there are several houses in each area which were constructed but not being utilized, maybe due to the current state of the access roads.

6.3.4 Disruption of Services

There may be some disruption of services within the area during the construction phase. The main utility lines such as GPL power lines, GWI waterlines, and GTT phone and internet lines are located on or beneath the shoulders of the roads. Disruption of these services are likely to occur since these service lines may require relocation or temporary disconnection to facilitate the safe and efficient construction of the roads. Construction activities may also accidently damage the infrastructure of these service lines and cause disruption of services. However, during the consultation with the secondary stakeholder such as GPL, it was noted that planned communities like the project areas are designed to accommodate road infrastructure and utilities services without causing any major disturbances.

Other concerns include the collection of garbage and the prevention of mobile water and grocery vendors from visiting the areas during the construction phase. Residents noted that this will be a temporary inconvenience and that there are alternative routes mobile vendors can take to get to the residents.

During the construction phase there may be diminish drainage capacity and disruption of drainage services in the areas. This may be exacerbated during heavy rainfall.

It is expected that residents may experience inconvenience in accessing the roads during the construction phase. This disruption of access can be mitigated by alternative routes and other arrangement extended to the residence during the construction phase.

The scoping visits did not reveal any essential community service such as police station, community health posts, clinics, and schools within the project areas. As such, it is unlikely that there will be any disturbance of essential services to the project areas and wider community.

6.3.5 Community Wellbeing

Residences are located in close proximity to the areas identified for construction in almost all of the areas targeted to benefit from project interventions. As such, there are expected to be some temporary impacts to the wellbeing of the community during the construction phase.

While the contractors are obligated to provide employment to the local communities in which the sub-projects are being executed, there may still be a need for core employees on the project. In some cases, these employees may be required to establish temporary residents throughout the duration of the project, which can result in a sudden influx of workers, particularly males, into the various communities. It is possible that this sudden influx could result in negative impacts such as conflicts, if not properly managed. Workers can be viewed as a threat by the local population because of their greater disposable incomes, particularly by the local males without steady employment. Additionally, the sudden temporary influx of workers, particularly male workers, within these communities can also present gender related risks such as, sexual harassment on women, adolescents and the Lesbian, Gay, Bisexual, Transgender, Queer, and Intersex (LGBTQI+) population. Workers will be required to adhere to a construction Code of Conduct in keeping with Section 7.4.5.

The project can negatively impact community health in the short term due to opportunities for dust, noise and water pollution. Homeowners will have to spend more time and resources on cleaning due to the impact from roadside dust. These impacts will be short and will be overtaken by the positive impacts from the project.

The project will not serve the entire community and upon completion there will still be areas without proper roads, streetlights, sidewalks and drainage, among other related needs of the community. This will negatively affect the residents of the sections of the communities that are unserved and continue to have unpaved roads and poor drainage, etc.

However, the project is expected to have a positive impact on the community and standard of living of the present residents by proving better and safer roads and other infrastructure. This will encourage occupancy in areas that are not currently occupied by making access easier and cheaper for the transportation of building materials. Once the project is completed land owners will be encourage to build or complete their buildings reducing the areas available for dumping of garbage, over-growth of vegetation and general lack of property maintenance, all contributing to positive environmental actions. The population density of the area will increase but it is not expected to lead to overcrowding. The new construction activities of property owners will also stimulate the local economy with greater demand for food, transport, and other services. As expected, the increase in incomes during the construction period will have a positive impact on the local community, boosting the local economy through persons from the community being employed and spending by construction workers. Improved infrastructure, especially roadways, will improve access to the area. This will benefit residents significantly and can reduce transportation cost. Overall, the project can increase the value of property within the project area.

The communities are expected to benefit during the construction phase by providing services such as skilled and unskilled labour and from support of the communities' local economy from the purchasing food and other items from businesses within the area.

6.3.6 Public Safety and Security

The areas identified for works are public access roads and therefore are frequently being used by residents of the communities and other members of the public. This would have some consideration for the safety of the public during construction phase, especially if planning for the community health and safety is not taken into consideration. Some of the risk likely to occur are: visiting the construction areas and playing/fiddling with construction machinery, equipment, and material especially by children, using roads that are actively under construction as a result of living in close proximity of the work site, and transportation of heavy machinery and materials causing traffic hazards and road accidents.

Post construction, the road works can increase the risk from vehicular collisions. Errant drivers are known to speed on newly built roads without speed humps. The impact is expected to be negative for sections of the communities with an overall low risk to stakeholders.

The influx of workers and non-local individuals associated with the project can have the ability to negatively impact the project community. The impact will be greater if the number of construction workers are individuals from outside the community is large within small project areas. Workers can bring alcoholism, drug use, gambling and other high-risk behaviors that can negatively influence the local people.

The project, by the nature of its positive impact on the communities, strengthened the need for increase security in the area. While the project will install street lights in some of the project areas, there is still a need for increased presence of street light and other security measures, especially in areas that have less occupancy.

Residents are hopeful that the development of the community will lead to greater awareness of security issues with more property owners taking the initiative to de-bush the area, own guard dogs, and install security cameras – all simple steps to reduce crime in the neighborhood. There was also the call to reactivate the Community Policing Group to support local crime fighting in the area

6.4 Health and Safety

6.4.1 Construction Workers

The health and safety of construction workers is a key concern during the construction phase of the project. Construction workers are likely to be exposed to a number of job-related hazards which can cause both minor and serious harm to workers especially if established guidelines and practices are not properly communicated nor complied with. These hazards are likely to be caused by operating heavy machinery, poor traffic management, exposure to noise and dust pollution, inhalation of fumes, improper use of machinery and equipment, dehydration and heat stroke.

Additionally, there can be physical injury and risk associated with other job-related activities such as accident during land preparation, transportation and off-loading of materials, slips and falls, These risks are likely to be exacerbated with failure to use or the improper use of personal protective gears and failure to adhere to the relevant health and safety guidelines and code of conduct.

Other health and safety consideration is the spread of COVID-19 which has recently seen a rise in the number of cases. This a likely concern since there will be close contact amongst construction workers during the project implementation. Members of the community are also at risk of contracting the virus if they are in close contact with the workers or are providing services to the workers.

6.4.2 Public Health

Residences are located in close proximity to the areas identified for construction in almost all of the areas targeted to benefit from project interventions. As such, there are expected to be some temporary impacts to the health and wellbeing of the community during the construction phase.

The level of noise pollution is expected to increase during construction from the use of heavy machinery. This may cause some discomfort to residences during the hours of operation and can be mitigated by using modern machinery with silencer and operating during the hours the residents are likely to not be at home. However, noise levels are not expected to affect the health of nearby residences.

There is likely to be an increase level of dust pollution during the construction phase of the project. This may cause some discomfort to residents as the dust may get into homes, which will require cleaning more frequently. However, this can be minimized by mitigation measures such wetting of the roads.

Once completed the project will improve the public health situation within the communities. The current drainage system in several of the areas in in a deplorable state, which allows for water stagnation/accumulation, which leads to the breeding of mosquitos, periodic flooding, etc. The project areas will benefit from improved drainage infrastructure under the project which will prevent water accumulation and other issues associated with it, such as mosquitos, flooding and erosion, and water damage to property.

6.5 Capacity Assessment

The Programme's approved ESMF and Operating Regulation establishes the Institutional Arrangements, which must be implemented by the CHPA in order to support the implementation of the ESMF tasks, and therefore ensure compliance with the Programme's environmental and social safeguards measures. It has been determined that the CHPA has the required institutional capacity to undertake Environmental and Social Safeguards Management throughout the duration of the Project. It was revealed that the CHPA's Institutional capacity was reinforced in accordance with the institutional arrangements set out in ESMF. For instance, a multi layered management system has been established to ensure compliance with the occupational health and safety, environmental and social requirements, with responsibilities designated at the different levels, including roles for the CHPA's Projects Department, specifically the Department's HSE Unit, and for the Contractors. As was previously indicated, CHPA has the overall responsibility for ensuring compliance. CHPA through the Projects Department's HSE Unit oversees the environmental and social aspects of the project. The Unit is therefore responsible for ensuring that all Contractors adhere to the environmental and social management requirements, which comprises the ESMP outlined in this ESA Study, and the ESMP sub-plans, which comprises Section VII.B of the Contract. Oversight will also be provided by CHPA's Civil Engineers, Clerk of Works and Environmental and Social Safeguards Works Supervisor.

6.6 Synopsis of Potential Impacts and Mitigation Measures

A synopsis of potential impacts of the project and mitigation measures recommended are presented in Table 6-7.

Table 6-7: Synopsis of Potential Impacts, Mitigation Measures and Management Plans by way of CHPA Sub-ESMPs and Monitoring Program

Potential Impact	Likely Phase	Proposed Management Plans and Mitigation Measures	Execution Responsibility	Verification	Monitoring and Reporting
Increased levels of dust/particulates	Construction and Operation	Environmental, Health and Safety Monitoring Plan (EHSMP)	Contractors and CHPA	CHPA	Weekly inspection reports and corrective action directives
Increased levels gaseous pollutants	Construction and Operation	EHSMP	Contractors and CHPA	CHPA	Weekly inspection reports and corrective action directives
Increased levels of noise	Construction and Operation	(EHSMP)	Contractors and CHPA	CHPA	Weekly inspection reports and corrective action directives
Surface water contamination	Construction and Operation	Waste Management Plan (WMP); Hazardous Materials Management Plan (HMMP); Emergency Preparedness and Response Plan (EPRP); Spill Prevention Countermeasures & Control Plan (SPCCP); and the Soil and Drainage Management	Contractors and CHPA	CHPA	Monthly inspection reports and corrective action directives

		Guidelines (SDMG).			
Ground water contamination	Construction and Operation	WMP, HMMP, EPRP, SPCCP and SDMG	Contractors and CHPA	CHPA	Weekly inspection reports and corrective action directives
Waste/Hazardous Materials	Construction Phase	Waste Management Plan; Hazardous Materials Management Plan; Emergency Preparedness and Response Plan; Spill Prevention Countermeasures & Control Plan (SPCCP);	Contractors and CHPA	CHPA	Daily inspection reports and corrective action directives
Natural Disaster (Flooding)	Construction and Operation	EPRP, SPCCP, SDMG and EHSMP.	Contractors and CHPA	CHPA/IDB	Monthly
Relocation - Loss of Livelihood	Construction	Livelihood Restoration Plan (LRP)	CHPA	IDB	Monthly Monitoring of Livelihood Restoration Plan indicators
Disruption of Utility Services	Construction	Provide advance notification of any planned interruptions to water and power service as a part of construction activities.	Contractors and CHPA	CHPA	Daily inspection reports and corrective action directives

Disruption to Transportation	Construction	Traffic Management Plan;	Contractors and CHPA	CHPA	Weekly monitoring
Community Wellbeing- Sanitation, Health and Recreation	Construction	TMP; Access Management Plan (AMP); WMP, HMMP, EPRP, SPCCP and EHSMP	CHPA	IDB	Weekly inspection reports and corrective action directives
Health and Safety	Construction	TMP, AMP, WMP, HMMP, EPRP, SPCCP and EHSMP.	Contractors and CHPA	IDB	Daily inspection reports and corrective action directives

7.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

7.1 Introduction

It is critical for construction activities to be conducted in a manner which is in compliance with the legislations and guidelines outlined in Chapter 4, and in particular with the requirements of the CHPA and the IDB. In this regard, this Environmental and Social Management Plan (ESMP) has been prepared to guide the construction activities by recommending measures to address the environmental, social and health and safety issues related to the construction activities. Activities to be undertaken in an effort to prevent, minimize and manage the principal adverse effects of the project are identified and recommended. A framework for the implementation of the ESMP is outlined in Chapter 8, including the roles and responsibility of all parties.

7.2 Mitigation of Physical Impacts

Impacts to the physical environment are expected to be short term, localized and mostly mitigable with no significant adverse impacts foreseen. This section outlines the recommended measures which can be implemented to ensure physical impacts are prevented or minimized.

7.2.1 Air Quality

As indicated under section 3.1.1.1 of Chapter 8 – Environmental, Health and Safety Monitoring Plan (EHSMP), the Contractors are required to maintain air quality standards in and around the project site, allowing the working force, residents and the environment as a whole to benefit from clean air quality. The Contractors are therefore required to adhere to the EPA's Air Quality Regulation 2000 and the air quality management measures outlined in the preliminary ESA.

Monitoring of air quality is to be conducted by the Contractors in accordance to the EHSMP, of which air quality testing should be conducted on a daily basis to ensure PM2.5 and PM10 are within the permissible standard set out in the WHO Air Quality Guidelines for particulate matter.

Apart from the measures outlined in the EHSMP of the bid document, the following are additional measures which can be implemented to prevent or minimise dust and gaseous pollution.

<u>Dust</u>

The following measures can be implemented to reduce the impact of dust on the environment:

- Truck drivers and operators should be instructed to reduce their speed when traversing dusty roads during dry conditions so as to minimize dust generation.
- Dusty roadways, particularly roads which have been graded should be soaked regularly.
- Personnel working within dusty environments or operating equipment that generates dust such as cement mixer should be required to use dust masks or respirators.
- Trucks transporting sand to construction sites should be covered.
- Sand stockpiles should be kept to a minimum height and covered if required.
- Stockpile areas should be located in areas away and downwind from residents.

Gaseous Pollutants

The following measures can be implemented to reduce the impact of gaseous pollutants on the environment:

- Consider as part of the purchasing procedure choosing machinery, equipment, vehicles and materials that are fuel-efficient.
- All heavy-duty vehicles and equipment engines should be operated and maintained in accordance with the manufacturer's operating specifications and should be serviced regularly so as to reduce the levels of combustion gases.
- Operators of heavy-duty equipment should be instructed to minimize excessive idling of the same.
- There should be no burning of garbage onsite.
- Maximise on the number of trips when transporting materials and workers between work sites.

7.2.2 Noise and Vibration

As outlined in the Project's EHSMP the contractors are required to ensure that noise levels in and around the project sites are at or below EPA's permissible noise levels for specific types of construction. This allows for the mitigation of noise generated by the Programme, which may otherwise represent a nuisance impact for receptors (people) near the active areas. Noise monitoring should therefore be conducted to ensure noise levels are within the standard limits (day and night-time limits) for the execution of construction activities as set out in the GNBS Guidelines for Noise Emission into the Environment (Section 3.3.3).

In order for monitoring to be conducted, the contractors will be required to secure a Portable Sound Level Meter, which is able to determine noise levels greater than 100 decibels. Noise monitoring must be conducted on a daily basis during the construction phase. Periodic monitoring should also be conducted based on a need, for example, if a new work area is to be utilized, or if there is a complaint among workers/residents of a disturbance. For the latter, areas for monitoring should include:

- Nearby Residential properties
- Workers' Facilities (if applicable)
- Commercial businesses and properties where daily activity is present during peak hours.
- Community facilities such as recreational spaces, health centers etc.

The following are recommended measures that should be implemented to reduce noise levels and vibration nuisance:

- Generators and other noisy equipment should be sited at a distance away from the nearest occupied building and general work areas and should only be in use when necessary.
- Noisy activities should be scheduled for daylight hours. Night works should be avoided.
- Noise levels should be controlled at the source via installation of silencers and mufflers on exhaust systems. Efforts should be made to ensure machinery and equipment are working efficiently.
- Noisy equipment such as generator should be enclosed in sound proofing material, if necessary.

- Personal Protective Equipment should be provided to employees exposed to high noise levels.
- Noise levels should not exceed 90 dB during the day and 75 dB at nights.
- Noise levels should be monitored on a periodic basis so as to ensure minimal impacts.
- Small trucks machines such as mini-excavators should be used where feasible so as to reduce the occurrence of vibration.

7.2.3 Water Resources

Surface Water

Impacts to surface water, which comprises primarily the drainage network, are somewhat consistent throughout the various phases of the project and are mainly related to contamination due to accidental spillage of fuel and lubrication oil. Other impacts include upwelling of sediments and sediment laden water discharge.

Impacts which are related to the contamination of water via accidental spillage of fuel, oil and other such substances will require mitigation measures since these can also affect aquatic lives. All fuel and oil base substances should be stored in a contained area which should be constructed with an impermeable base so as to avoid penetration. Servicing of equipment should be done at a designated site which will be at least fifty feet from the nearest drain. Drip trays should be used to collect waste oil from equipment during servicing. All fuel and oil-based substances including oil filters and oil rags should be stored in sealed five-gallon buckets and removed from the site immediately after completion. See Table 7-1 for waste management measures.

With regards to upwelling of sediments, this is expected to be temporary and localised and as such, will not necessarily require mitigation measures. Also, most of the existing drains are badly silted up and will require some amount of cleaning so as to accommodate the increased volume of storm water once the project is completed. Impacts relating to sediment laden water discharge are likely to occur from sand fill and stockpiles. White sand fills should be managed by retaining walls, in this case the road shoulders, while stockpile materials should be located more than fifty feet from the nearest drain. In situations where materials do runoff into drains, the contractor should excavate so as to not compromise the drainage capacity as well as, to maintain the flow of water. In addition, the following measures should be implemented by the various contractors to prevent or minimize erosion and subsequent sedimentation of nearby water bodies:

- All activities are to be undertaken with the strictest of conformation to the recommended practices to prevent erosion and sedimentation.
- The removal of vegetation should be limited to areas where it is absolutely necessary, where only areas required to be cleared for the project should be cleared.
- Areas of exposed soils should be monitored during periods of heavy rainfall including stockpiles, excavated areas and recently worked areas. Monitoring of these areas is a precursor to taking mitigation action and if the potential for sedimentation is observed, then mitigation measures should be implemented such as sediment fences/traps.
- Appropriate machines should be utilized for all earth works.
- Routes should be designated for heavy duty equipment to prevent compaction of soil. If ponding is observed due to compaction, it may be necessary to scarify the topsoil so as to allow percolation which reduces the occurrence of runoff.

- The weather pattern should be considered before initiating major earthworks. Major earthworks should be avoided during periods of heavy rainfall.
- Natural re-vegetation should be allowed in areas where possible to prevent further soil exposure.

Effluent discharge such as black water (sewage) and grey water (kitchen/domestic) can also contaminate surface water and create unpleasant odour. In the case of black water all temporary toilets should be connected to removable septic tanks. These septic tanks should be equipped with multiple phase faeces process which eliminates the likeliness of solid wastes discharge with effluence. For example, the 'Royal Septic Tank' which is available in Guyana comes with a four phase faeces process that allows for the complete separation of sewage and grey water through a displacement system and as such eliminates the need for further mechanisms such as soak away systems. If septic tanks become full during the course of the project, Contractors should make arrangement for a waste disposal company to empty all filled tanks.

Grey water generated on site is expected to be minimal as such, this waste stream can be channelled into the external drainage system within the area where it will be displaced by a larger body of flowing water.

At the end of the project, each septic tank should be emptied and removed from the project areas. Once emptied, all pipes which are connected to the tanks should be cut-off and sealed with PVC caps. An excavator should be used to carefully remove the tanks from the ground and loading onto trucks to be transported.

While overall long-term impacts of the project are expected to be largely positive, the issues regarding surface water contamination could be exacerbated as the development will motivate persons who have not yet occupied their lands to do so. In this regard, the following recommendations could be considered so as to minimize adverse impacts and optimize positive benefits in the long-term:

- Adequate spill prevention and response measures should be in place.
- Implementation of a drainage canal maintenance program as part of the program intervention to maintain maximum capacity of canals. This should be executed in collaboration with the local Neighbourhood Democratic Councils (NDC) and the National Drainage and Irrigation Authority (NDIA).
- Implementation of a community - wide solid waste management program.
- Consider the potential for the establishment of a sewage system for the housing scheme.
- Conduct additional surface water quality testing prior to the commencement of construction. Parameters should include those tested during the baseline assessment, in addition to phosphates, nitrates and faecal coliform.
- Conduct water quality monitoring as is outlined in Section 8.6.

Ultimately, the contractors must adhere to the Environmental Protection (Water Quality) Regulations. The CH&PA has developed a Spill Prevention, Control and Countermeasures Plan (SPCCP), Erosion Control Guideline (ECG), EPRPP and a WMP, which all contractors are required to implement, as is outlined in Table 6-7. Monitoring the implementation of these plans are further discussed in Sections 3.1.2 to 3.1.7.

To ensure that the Project is not negatively affecting surface water quality, contractors will be required to monitor surface waterways and discharge points within the Project's boundaries, with particular focus on turbidity. Water Quality Testing should be conducted regularly to ensure turbidity is within the permissible standard limits (Table 3-1).

Regular monitoring of turbidity is to be done to analyse sediment discharges at locations downstream and upstream of construction areas. During water quality testing, observations must be recorded with respect to the weather condition, time of sampling and the general appearance of the water colour, if the water body has a stench and the construction activity being undertaken at the time.

Ground Water

The measures identified to manage and mitigate impacts to surface water resources are also applicable to that of ground waters resources. Other measures which could be implemented to mitigate impacts to ground water resources can also include the following:

- Identify and demarcate all water mains prior to excavation activities.
- Identify and mark the locations of all existing damages to water main and report same to the relevant authorities.
- Water mains that become damaged during project activities should be reported to the relevant authorities for swift action.
- Handling of hazardous materials such as fuel, lubricants, waste oil, etc. should not be done within the vicinity of damaged water mains.

In addition to these measures, the contractors will be required to implement, as best as possible, all measures outlined in the WMP, HMMP, EPRP, SPCCP and the Soil and Drainage Management Guidelines, all of which are detailed in the Bidding Document.

7.2.4 Geology and Soil

The fact that the project is not foreseen to have any significant impacts to the geology of the communities selected for intervention suggests that no mitigation or management measures will be required. However, with regards to soil and topography, erosion control operations should be performed under favourable weather conditions. Erosion control materials will not be applied in adverse weather conditions which could affect their performance.

The design of storm water control measures and surface drainage requirements during construction should be based on rainfall intensity data to determine the appropriate design storm for construction, particularly for concrete drains. Surface water runoff from the site should be controlled to prevent erosion and resultant sedimentation of receiving drains.

Runoff should not be discharged from the site in quantities or at velocities substantially above those which occurred before the commencement of construction works. Earthworks should be avoided during periods of heavy rainfall.

Vegetation clearing where necessitated should be conducted in a manner to ensure there are no large increases in sediment discharge to receiving drains. Existing vegetation should be maintained to the extent practical to provide interception cover and soil stabilization along road shoulders. Drains that receive run-off from road works should be visually monitored for sediment

accumulation and turbidity. Monitoring should also include visual inspection of areas of exposed soil for signs of erosion during periods of heavy rainfall.

7.2.5 Landscape

Seeing that the project will have a positive impact on the landscape of these communities, further enhancement measures can be implemented such as replanting of lawn grass and other decorative plants along road shoulders to help with soil erosion and soil stability, while contributing to the aesthetic of these communities.

7.2.6 Drainage

The following measures should be implemented to reduce negative impacts to drainage and to prevent flooding during the construction period:

- Monitoring of drainage flows throughout the project areas while cofferdams are being used during construction activities, particularly during raining conditions.
- Ensure that all cofferdams are removed as soon as the need for such is no longer necessary.
- Implement erosion and sedimentation measures identified in sub-section 7.2.3 for surface water and 7.2.4 for geology and soil.
- Ensure construction materials do not block drains and any materials which may enter the drains should promptly be removed.
- Post-construction monitoring of water flows so as to ensure that all cofferdams and silt up areas have been appropriately addressed.

7.2.7 Microclimate

As noted, it is not foreseen that the project will result in any significant negative impacts to the microclimate within these communities and, as such, no mitigation measures are required. However, abatement measures such as re-vegetating road shoulders with lawn grass and planting of decorative plants/trees can be beneficial in reducing the occurrence of increased temperature caused by absorbed solar radiation on asphalt surfaces, which can result in heat island. Such measures can significantly minimise the impacts on microclimate within these communities.

7.2.8 Flood Risk/Disaster Management Measures

As noted, the project could have a net positive impact on the areas in which it is to be executed with respect to natural disasters, particularly flooding. The key therefore to achieving a net positive impact will be the careful selection, combination and implementation of a series of adaptation measures that protect vulnerable areas. These measures should be cost-effective in their implementation, build resilience and effectively address the identified hazard, rather than just relocate it. For instance, flood protection should not create worse flooding in nearby areas.

The following measures should be considered in collaboration with other relevant Ministries and Government entities to ensure the long-term viability of the project:

- Enforcement of adequate building codes and adequate land use regulation.
- Reinforcement of sea and river defences by considering sea level rise projections in vulnerable areas.

- Implementation of building set-back legislation and/or minimum residential housing living area elevation standards to limit buildings and other major developments on high risk and vulnerable to climate change zones.
- Provision of adequate and regular maintenance to the existing drainage system.
- Installation of mechanical pumping stations to aid drainage of water during high tide and precipitation events. These pumps will help flowing out excess water in the drainage canals.
- Continued promotion of rain harvesting activities in the new housing developments.
- Consider addition of infrastructure to divert storm water run-off to lower-lying, permeable areas to encourage more groundwater recharge.
- Ensure infrastructure such as roads are built above normal flood levels.
- Encourage landfilling to above normal flood levels.

During the construction phase, it is imperative that measures be implemented to prevent localised flooding within the construction areas. Measures to be implemented by the contractors should include the following:

- Areas of exposed soils should be monitored during periods of heavy rainfall including stockpiles, excavated areas and recently worked areas. Monitoring of these areas is a precursor to taking mitigation action and if the potential for sedimentation of drains is observed, then mitigation measures should be implemented such as sediment fences/traps.
- Construction materials should not be stockpiled in close proximity to the drainage system which can result in materials entering the drains. Any material entering the drain as a result of stockpiling or construction works should be immediately removed.
- Alternative drainage should be identified prior to blocking of any drain. The alternative drain should be cleared of any encumbrances and is functioning properly.
- If alternative drainage is not available then pumps should be utilised by the contractors to ensure drainage of the area is maintained.
- The local area drainage should be monitored throughout construction works in that area.
- Upon conclusion of construction works in an area the drainage system should be adequately restored with the removal of cofferdams, debris and any other encumbrance.

Also, in accordance to the CHPA Soil and Drainage Management Guidelines, the following measures are to be taken by the contractors and the Project Execution Unit (PEU) to mitigate against flood disaster:

- **Schedule Activities -** Consider the weather pattern before initiating major earthworks. Schedule construction activities to avoid periods of heavy rainfall. Monitor areas of exposed soil during periods of heavy rainfall.

- **Silt Fencing/Sediment Barriers -** Installing porous barriers to collect silt can dramatically reduce sediment pollution on the opposite sides of the barrier. Silt fences are commonly used as they are cost effective and readily available. They should typically be used as the primary silt collection tool and may be augmented with other sediment barriers. Use silt fence as a perimeter control measure, and around soil stockpiles. Install silt fence along contours. Key silt fence into the soil and stake. Do not use silt fence for concentrated water flows. Install fence at least 1 meter back from the slope to allow for sediment storage. Wire backed fence can be used for extra strength. Avoid installing silt fence on slopes because

they are hard to maintain. All sediment barriers must be inspected and maintained during construction and restoration.

- **Upland Runoff Diversion -** The movement of water from area up-slope of the excavation (upland runoff) can be a significant cause of sediment pollution and may increase water in the excavation itself. Controlling the velocity of upland runoff and creating a barrier between the site and the upland location can help stabilize the soil and minimize water in the excavation. Engineering measures such as berms or swales may be used be to limit the amount of erosion and sediment movement from upland locations. Minimizing the length and steepness of slopes, and contouring is essential in reducing upland runoff.

- **Vegetation -** Maintain natural vegetative cover (especially along roads and adjacent drainage) as far as practical; clear only areas required for construction purposes. Where possible, revegetate areas with extensive soil cover that has been disturbed. Retain vegetation in the vicinity of steep slopes, where practical. Implement seeding where necessary.

- **Wind Erosion Control -** Like sediment, the movement of soil by wind can produce off site pollution. Managing dust can be solved by spraying the area with water and or covering dusty areas such as stock piles. It is important that dust is not wetted so much that it will wash into nearby drainage inlets or waterways. Soil stockpiles that will be left exposed for more than 10 days, must be covered with tarps or matting when not being used. Dust screens can also be erected around stockpiles which have a high risk of generating dust during windy conditions. Transport materials which are suitably covered and loaded in a manner that will prevent dropping of materials.

- **Protection of Drains, Culverts, and Swales -** Culverts, drains, and swales are all designed to gather large amounts of rain water and transfer it to other waterways off-site. As a result, they can transport significant quantities of sediment. The protection of storm-drain inlets, culverts and swales in or near the work area should be identified prior to the start of excavation. Inlet protection measures should capture the majority of sediment while allowing water to flow in order to minimize flooding. Silt fence and stone filter berms are common methods to prevent the inflow of sediments to surface water. Filter fabric can also be secured to culvert ends with steel bindings to allow storm water to enter the culvert while minimizing the potential for sediment discharge during periods of heavy rainfall. Use gravel bags, (or similar product) around drain inlets located both onsite and in gutter as a last line of defense.

- **Additional Measures:**

    - During periods of heavy rainfall, ensure active construction areas such as culverts, stock piles and excavated areas are properly covered with erosion control measures such as control blankets, geotextile fabric, tarps etc. where necessary.

    - To reduce incidences of flooding, ensure that drains/canals are not filled with Construction debris. Drains should be inspected and cleared on a regular basis to promote free flow of water.

- Ensure sure spoil piles are surrounded by toe drains and perimeter berms to manage any discharge of sediment.

- Take necessary precautions to avoid erosion, siltation and sedimentation by limiting the size of disturbed area, slope length and gradient and the duration of soil exposure.

- Store temporary stockpiles of construction materials including excavated waste in a secure, designated area, and protected from wind and water erosion. Materials should not be placed in close proximity to a watercourse.

7.2.9 Waste Management

The project will generate waste, which, if not managed properly, can result in soil and water contamination, contribute to ill health, and affect the aesthetic of the general area. Waste piles often present an eyesore and can affect the aesthetic of any environment. The improper disposal of waste, especially kitchen and food waste can result in odour and attraction of vermin. Waste to be generated includes domestic garbage, which usually consists of a mix of bottles, bags, cans, boxes, plant residues, excess food and kitchen scraps and old clothing and paper. These will mainly be generated by construction staff on a daily basis. Liquid waste will also be generated including sewage waste and waste water from washing. Hazardous waste to be generated includes waste oil, filters and oil containers which if not properly managed can result in water and soil contamination. Construction waste is also expected to be generated in large quantities and would include wood, form boards, cut steel, broken concrete, etc. Materials which could be reused can be given to persons from the communities if requested or be transported back to the Contractors' head offices. Excavated materials such as spoils and materials excavated from drains during drain cleaning activities are other types of waste. Other recommendations for disposal of these waste are outlined in Table 7-1.

Table 7-1: Types of Waste and Recommended Disposal Methods

Waste Category	Waste Type	Disposal Method
	Kitchen Waste	Domestic waste generated from kitchens, where construction workers would be temporarily housed, should be collected in bins for disposal at an approved landfill site.
	Cardboard/Paper	A small volume of these materials is expected and would mainly be generated from packaging of construction materials. These should be collected in covered bins and further disposed of at an approved landfill site.
	Plastic Bottles/Cans	These materials should be collected in covered bins and further disposed of at an approved landfill site.

Waste Category	Waste Type	Disposal Method
Solid Waste	Construction Waste (Old Wood, form boards cut steel, etc.)	These materials are expected to be generated in large quantities. Materials which could be reused can be given to staff or persons from the communities if requested or be transported back the contractors' storage for reuse. Excess and damaged materials along with other construction wastes can be dumped in dumpsters until accumulated and can be disposed of at an approved dumpsite, such as the haags bosch dumpsite in Eccles.
	Excavated materials such as spoils and materials removed from drainage cleaning	These types of wastes can be loaded onto trucks for disposal at an approved dumpsite, such as the haags bosch dumpsite in Eccles.
Liquid Waste	Grey water - Waste Water from Kitchen/Bathing Facilities	Wastewater from these facilities should be drained into a soak away system.
	Sewage/Black water	All temporary toilets such as those to be used at site offices or workers housing should be connected to removable septic tanks. These septic tanks should be equipped with multiple phase faeces process which eliminates the likeliness of solid wastes discharge with effluence. For example, the 'Royal Septic Tank' which is available in Guyana comes with a four phase faeces process that allows for the complete separation of sewage and grey water through a displacement system and as such eliminates the need for further mechanisms such as soak away systems. Effluent can be discharged into large bodies of drainage water so as to be easily displaced. Portable toilets should be utilised at the worksites. These should be well maintained. An adequate number of portable toilets should be provided based on the number of workers at the site.
Hazardous Waste	Waste Oil	Waste oil collected during servicing of equipment should be stored in sealed plastic containers and given to persons from nearby communities who would use the waste oil on chain saws and other mechanical equipment.
	Oily Rags/Filters	The quantity of oily rags, oil and fuel filters to be generated is expected to be minimal and will be mainly generated from servicing of equipment. The contractors will therefore be required to store these in sealed plastic containers and disposed of at an approved landfill site.
	Contaminated Soil	Soil, which may become contaminated due to accidental spills of oil, fuel and other such hazardous chemicals, should be excavated and stored securely in plastic containers and be disposed of at an approved landfill or kept until the contaminant is been broken down by bacteria.

In addition to the above listed measures that emphasize reuse and recycling, aimed at avoiding excess waste creation, the following measures will enhance further environmentally conscious waste disposal:

- Waste collection receptacles such as drums should be placed at strategic locations within each work zone. These should also be equipped with covers.
- No burning of waste should occur within the project environs.

The issue of waste management is expected to be exacerbated during the operational phase, as the development will motivate persons who have not yet occupied their lands to do so. However, while it is easy to mitigate this issue during the construction phase, it might not necessarily be the same during the operation phase, since this will require a more sectorial approach, through the implementation of policies and measures. The following recommendations could be considered so as to minimize adverse impacts and optimize positive benefits:

- Implementation of a community - wide solid waste management program which should be executed in collaboration with the local NDCs.
- Establishment of a sewage system for the housing scheme.

In addition to these measures, the contractors will be required to implement, as best as possible, all measures outlined in the WMP, HMMP, EPRP, SPCCP, EHSMP and the Soil and Drainage Management Guidelines, all of which are detailed in the Bidding Document.

7.2.10 Fuel, Lubricants and other Hazardous Materials

Fuel and lubricants are classified as hazardous materials and require special consideration in terms of transportation, storage and handling. Improper management of these materials can result in spills and leakage which can contaminate soil and water resources or even result in fires. However, given the works to be conducted it is not expected that there will be the need for significant amount of fuel and therefore fuel storage onsite should be limited. Nevertheless, the following measures should be implemented to ensure the likelihood of contamination of soil or water from spillages or leakages as well as risks of a fire are minimized:

- All fuel, lubricants, waste oil and empty fuel containers should be stored within a contained designated area which should be impervious.
- Significant amount of fuel should not be stored onsite, but should be brought as is required. This will eliminate the need for extensive storage facilities and reduce the risk of contamination from spills and leaks.
- Employees should be properly trained in handling of fuel and in refueling practices.
- Spill kits should be made available to contain and clean up any spillages occurring. The kits should be placed in strategic locations that are easily accessible. Workers, mechanics and other staff should be trained on how to utilize spill kits.
- Fuel storage areas should have the necessary warning/caution signs in place including ‘No Smoking’ and ‘Flammable Area’.
- Fire extinguishers and sand buckets should be made available within proximity to the fuel storage area.
- Fuel storage areas should be sited at a safe distance from any drain, offices and work areas.
- All fuel storage containers should be adequately labelled.

- All used oil and grease should be collected and disposed of appropriately.
- Care should be taken to prevent spillage and leakage of fuel during off loading and refuelling. When refuelling is completed, all nozzles, hoses and other materials should be stored in a proper manner to avoid spills.
- The storage areas should be checked daily for leaks. Leaks should be immediately reported and corrected.
- Ground sheets or drip trays will be used in the servicing of machinery and vehicles to capture any spill that may occur.

In addition to these measures, the contractors will be required to implement, as best as possible, all measures outlined in the WMP, HMMP, EPRP, SPCCP, EHSMP and the Soil and Drainage Management Guidelines, all of which are detailed in the Bidding Document.

7.3 Mitigation of Biological Impacts

Combined, the communities which comprised the project area portrays a typical urban like setting and has been under human development for decades. Like most urban areas, the biodiversity may not be as diverse as that in rural areas, as such, the project areas lacks significant biodiversity (both flora and fauna) and therefore holds little ecological value. Existing flora and fauna within the project areas are therefore not likely to be impacted negatively. To this avail, no mitigation nor management measures are required.

7.4 Mitigation of Socio-economic Impacts

7.4.1 Archaeology and Cultural Heritage

The possibility of a discovery of an artifact during project construction is extremely low. However, a Chance Find Procedure should still be in effect and should be implemented if there is a discovery.

Chance finds should be reported to the National Trust of Guyana as soon as there is any indication that there may be artifacts within any of the project sites. The National Trust will advised on how to proceed with either extraction of the artifact or wait on their professional assessment.

If any project related personnel believes that they have encountered any archaeological material, the Chance Find Procedure outlined below should be adhered to:

1. All construction activity within the vicinity of the find is to cease immediately;
2. The find must be recorded and artefacts left in place;
3. The National Trust must be contacted immediately;
4. The National Trust should assess the find and mitigation options identified in coordination with the project management; and
5. If the archaeological finds need to be removed for some significant reason the following steps can be taken:
    - All finds need to be handled as if they are extremely fragile;
    - Should the finds break during handling or movement – all parts must be gathered and stored together;
    - Each separate piece should be moved separately and not stacked during movement or storage;

- Finds must be handled with both hands providing full support in order to avoid breaking;
- Objects can be wrapped in cloth or soft paper on order to prevent them from moving in storage or from being damaged further;
- Maintain contact with the National Trust to ensure that the finds are secured until they arrive at the site.

The CHPA should ensure that all contractors and construction staff are aware of the procedure and are equipped with the necessary contact details for the appropriate authorities.

7.4.2 Livelihood, Relocation, and Resettlement

During the assessment of impacts on livelihood, relocation and resettlement as discussed in Section 6.4.2, it is unlikely to be any major changes to the status quo of resident since there will be no relocation of households, businesses or any other permanent or semi-permanent structures within the project areas. There is also expected to little to no damage to personal property during the construction phase.

There are very few businesses located within the project area, the two prominent being a general store and a mobile fish and chips van. The general store is located in the yard of the resident in Herstelling. To prevent any adverse loss of income, a temporary access bridge should be built so that patrons may have the ease of access when entering the business. The mobile fish and chips van which operates outside of the community. There is no adverse effect on this business since it operates outside of the community and the owners and operators suggest that the unit can be parked at an alternative location during the construction phase.

Given that no significant loss of livelihood is envisaged there will be no need for the preparation of the Livelihood Restoration Plan. However, the CHPA has prepared an LRP in order to outline a process in the case that there is some livelihood restoration required or a grievance received from stakeholder. In this case, any reported loss of income from businesses should be accounted for in the Entitlement Matrix, after a process of assessment and verification. A copy of the LRP is attached as Annex 4.

There is likely to be some disturbance of access bridges leading into the yards of residences during the road construction. This can be mitigated by providing temporary bridges and access points to the residences. Additionally, bridges and entrances that have been destroyed to facilitate the construction of drain, pavements, and rehabilitation of the road should be reconstructed using the Entitlement Matrix of the project.

7.4.3 Land Use

The project is not intended to change the current land uses within the project area. The upgrades are to existing roads and drains. It is therefore not expected that there will be need for any mitigatory measures related to land uses.

7.4.4 Disruption of Service

Given the nature of the project activities, there may be cases where there is disruption of services or utility poles or water lines may require relocation. There is also the possibility of utilities being damaged by construction activities and would require repairs. In some cases, residents may also

have to utilize alternative routes to access their home due to traffic disruption. As such, the following measures should be implemented to ensure the utilities and other services are not adversely affected:

- Advance notice should be given to the utilities company including the Guyana Telephone and Telegraph Company, Guyana Water Inc. and Guyana Power and Light Inc. to identify areas where the utilities are located.
- Advance notice should be given to residents within the project areas and other areas that may be affected by disruption to essential services so that they may be able to plan and make provisions for the disruption.
- If there is need for relocation, the utility company should be contacted and facilitated promptly so as to avoid discomfort to the residents.
- If any utility is damaged during construction the utility company should be contacted immediately. The contractors should have all contact information for the responsible personnel of the utility companies should an unintended disruption occur and need for urgent repairs.
- Care should be taken to avoid any disruption to utilities lines
- Monitoring of all construction site should be conducted on a regular basis by both the CHPA as well as the contractors to ensure that the utility services are not affected.
- In areas with drain works, the contractors should pall-off the utility poles to prevent them from falling if the earthen material is excavated in the process.
- Contractors should coordinate with CHPA and GPL to power down internal circuits with works on days/hours involving heave machinery close to its utility poles.
- The CHPA Traffic Management Plan (TMP) should be implemented to ensure effective traffic management during the construction period. The TMP is included as Annex 5.

The site visits did not reveal any essential community service such as police station, community health posts, clinics, and schools within the project areas. As such, it is unlikely that there will be any disturbance of essential services to the project areas and wider community.

7.4.5 Community Wellbeing

The likely impacts that have been identified in Section 6.4.5 are associated with the overall wellbeing of the community which may temporarily affect the quality of life of the community. However, there are several mitigation measures that can be implemented to limit the effects of the project related activities.

In the instance of dust pollution, the contractor can undertake to ensure that this occurrence is minimal and is seldom experience by the residents by implementing the measures outlined in Section 7.2.1.

While noise pollution may be unavoidable because of the nature of the project, there are steps the contractors can take to ensure that this impact does not severely affect the residents. Contractors can ensure that heavy duty equipment and other machinery are working efficiently and have silencers, project activities that would involve loud noises occur during the hours when residents are not likely to be home, and ensure that the project is completed on time and in an efficient manner so that residents are not subjected to prolonged project related impacts. Measures outlined in Section 7.2.2 should be implemented.

Adequate notices of works should be provided to property owners so that they can implement the necessary measures to protect their properties. Where accesses to homes/properties will be disrupted this should be communicated to the affected parties in advance, and alternative access be provided.

Further, there should be a clear and effective grievance mechanism for stakeholders to lodge complaints or to give feedback on the project. Having a clean and concise Grievance Redress Mechanism (GRM) would allow stakeholder to feel more comfortable with the project knowing that there is room for redress should the need arise during the life of the project. The GRM should cater for grievances from vulnerable groups.

The contractors and CHPA should engaged directly with the communities to monitor all issues relating to dust, noise, flooding, and other health and safety concerns. In addition, regular site visits and stakeholder consultation should be conducted during the period of construction to ensure that environmental, social, health and safety concerns are addressed, and measures are implemented for the benefit of the workers and community. Construction workers coming into the community should be properly briefed on the laws and social norms, particularly unwanted attention forced onto females. In this regard, the preparation of a Code of Conduct for construction workers is recommended to guide the behaviour of workers onsite during project construction.

The Code of Conduct for workers are a set of guidelines that are aimed at ensuring care and caution are taken by the employers and employees when undertaking works in communities, especially hinterland and indigenous communities. Project workers compliance with the measures outlined in the Code of Conduct can significantly reduce the potential for conflicts between project workers and the communities within which the works are being conducted. The Code of Conduct should address prevention and management measures for environmental, labour, and social risks of the project, including health and safety risks, sexual and gender-based violence, discrimination, and sexual abuse and exploitation of children and other individuals or vulnerable groups and should be applicable to the contractors and subcontractors' employees. A sample Code of Conduct is included as Annex 3 which should be used as a guide by the contractors to prepare the Code of Conduct for this project.

The Code of Conduct should be written in plain language and in a manner that is clear, accessible, and understandable, and should be properly communicated to the employees. Some measures that ensure that the communication is effective include the employees:

- Affix their signature to the Code of Conduct after reading it
- Receive a copy of the Code
- Had the Code explained to them
- Understand that the Code of Contract is a condition of employment, and violations can result in consequences including fines and dismissals.

To ensure the effective communication of the Code of Conduct to the employees, community, and affected people throughout the project implementation, a copy of the Code should be displayed at an accessible location and in a language that is comprehensible and free from jargons. The Code of Conduct should make the following provisions:

- Compliance with applicable laws, rules, and regulations.

- Compliance with applicable health and safety requirements (including wearing prescribed personal protective equipment, preventing avoidable accidents and a duty to report conditions or practices that pose a safety hazard or threaten the environment).
- The prohibition of the use of illegal substances.
- Sexual harassment (for example to prohibit use of language or behaviour, in particular towards women or children, that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate).
- Violence or exploitation (for example the prohibition of the exchange of money, employment, goods, or services for sex, including sexual favours or other forms of humiliating, degrading or exploitative behaviour).
- Protection of children (including prohibitions against abuse, defilement, or otherwise unacceptable behaviour with children, limiting interactions with children, and ensuring their safety in the project area).
- Sanitation requirements (for example, to ensure workers use specified sanitary facilities provided by the contractor and not open areas).
- Avoidance of conflicts of interest (such that benefits, contracts, or employment, or any sort of preferential treatment or favours, are not provided to any person with whom there is a financial, family, or personal connection).
- Respecting reasonable work instructions (including regarding environmental and social norms).
- Protection and proper use of property (for example, to prohibit theft, carelessness or waste).
- Duty to report violations of the Code.
- Non retaliation against workers who report violations of the Code.
- Respecting the rules, norms, customs and practices of the nearby indigenous community.
- Non-discrimination in dealing with the local communities (including vulnerable and disadvantaged groups), the Employer's Personnel, and the Contractor's Personnel (for example on the basis of family status, ethnicity, race, gender, religion, language, marital status, age, disability (physical and mental), sexual orientation, gender identity, political conviction or social, civic, or health status)

7.4.6 Public Safety and Security

The public safety and security are important to ensure that the project and project activities does not aid the effects of an unsafe project environment, especially since project activities will be conducted in close proximity to residences.

To prevent or minimize instances of negative impacts of public safety and security, there should be consideration in ensuring that the project sites are secured and that loiters, children and other residents are prevented from visiting active construction sites intentionally or unintentionally. This can be done by the use of warning signs, safety cones, use of reflective signs, barricades and directions to alternative routes. Contractors should also employ security personnel to secure the site during inactive construction periods, and to keep watch over construction equipment and construction materials. In addition to these measures, the contractors will be required to follow the required guidelines as is outlines in Section VII-B of the Bidding Document, which states that the contractors have to adequately close the construction areas and do not leave trenches open without proper demarcation so as to avoid accidents.

Upon the completion of the road, there is likely be some increased risk relating to vehicle collision and speeding, it is recommended that an adequate number of speedbumps, street signage, road

markings, and street lights are installed to avoid vehicle collision and speeding. Street light and road marking will also aid in the safe road use of pedestrians.

Before the construction commences, contractors should meet with the CHPA and community groups to gather data about the community and to understand the current community dynamic and learn about the values of community. This should be reflected in a construction workers Code of Conduct which must be adhere to at all times by all employees. The result of this would ensure that community rules and guidelines are followed in relation to construction workers

The Contractors can employ their own security to protect their company's assets and liaise with the police to patrol the area on a regular basis. Contractors should make every effort not to work beyond the regular working hours so as to ensure that workers leave the site during daylight hours. Night time works should be avoided if proper lighting facilities are not available since this could increase the overall risks to employees and residents.

7.4.7 Vulnerable Groups

Due to the nature of the project, there should be specific intervention to mitigate any impacts on the vulnerable groups and disable persons using the roads within the project areas during and after construction. The consideration of specific measures will enable road users within these groups to traverse the area in a safe and efficient manner, taking into consideration their specific needs and requirements. These mitigation measures are:

Construction Phase

1. Adequate lighting of the project during construction phase, specifically in areas that are dug out and may have unsuspecting pitfalls. There should also have adequate lighting around machinery and stockpiles. Active construction areas should be cordoned off using reflective caution tape or barriers.
2. There should be advance warning of construction zones including flashing caution lights, reflective signs and detour instruction
3. Community members should be informed about detours and alternative routes prior to the construction, and the routes should be posted publicly.
4. There should be adequate and safe alternative access points for persons living within the project locations.

Operation Phase

1. There should be adequate street lighting once the project is completed which would ensure the safety and visibility of motor vehicles and pedestrians using the road.
2. There should be a raised walkways or pavements along the shoulder of the roads. This would ensure that pedestrian, especially children are not walking directly in the path of motor vehicles.
3. There should be adequate road markings, signage, and street names that would make using the roads easier and less confusing for road users. The markings would also help to identify landmarks for persons who may not be able to remember exact locations and positions.
4. There should be an adequate number of speed humps so that motor vehicle drivers would be less inclined to speed especially given that the road will be smooth and without hindrances. This will ensure the overall safety of the community, especially children and disabled persons.

7.5 Health and Safety

7.5.1 Construction Workers

Contracting companies and their associates, should be aware of the Guyana's Occupational Safety and Health Act and as such, implement measures to comply so as to ensure a safe and healthy environment for all staff and other land and road users. The following measures can be considered; however, the project should not be limited to these measures alone as there may be others that can also be implemented:

- Each contractor should have in an established Occupational Health and Safety Policy which should be well known to all staff. The policy should also be posted where it can be easily accessible at the various site offices.
- Each contractor should have a worker's Code of Conduct will outline the required behavior on the work site. This code of conduct should include the mandatory use of PPEs, community guidelines, among other things relating to the health and safety of the community and themselves. The CoC should be signed and a copy should be given to each worker. Additional, a copy should be kept at each worksite for easy referencing and guidance.
- Each contractor should have on their team, a health and safety officer. This individual should conduct routine visits/checks to all active construction sites and equipment so as to ensure that all safety measures are fully in place. Checks should be guided by a simple to use checklist form. Operational areas are also to be monitored to ensure compliance with all health and safety requirements and that good health and safety practices are maintained throughout every aspect of the construction.
- A Job Safety Analysis (JSA) should be conducted for every high-risk activity if not, daily works.
- A vehicle should be permanently available on site to be used for all emergency cases. This vehicle should be regularly serviced and be kept in a good working condition at all time.
- Contractors should establish or have in place proper arrangements with the Diamond Diagnostic Centre, as well as the Georgetown Public Hospital, which is the main referral hospital in Georgetown, for any emergency cases.
- A Health and Safety Committee should be established and meet on a monthly basis to review health and safety performance and discuss measures for improvements. This committee should include at least one member from the CHPA.
- All staff should undergo an induction exercise on occupational health and safety and regular training programs on safe practices and proper handling of equipment and machinery.
- Workers operating certain equipment and conducting risky tasks should be provided with specialized training and proper skills set to allow for efficient and safe utilization of vehicles and machinery.
- All employees should be properly oriented to safety and health practices consistent with the construction activities.
- All workers should be provided with the necessary protective gear and attire (gloves, respirators, hard hats, high visibility vests, protective glasses, long boots and safety boots) as required. Employees required to work in the rain should be provided with wet weather gear.
- All employees should be required to wear safety equipment and protective clothing provided to them.

- Employees not wearing prescribed safety clothing and associated equipment in an area where the use of such is mandatory should be required to leave such designated area and should be subject to disciplinary action.
- Smoking should not be permitted anywhere in or near the fuel storage areas or in any other designated non-smoking area.
- Operators must be licensed in accordance with the Laws of Guyana and have the requisite experience and training.
- First Aid Kits with the requisite drugs and equipment to cater to emergencies or occurrences should be available at all project sites.
- Snake bite kits should be available at all project sites.
- Workers should be trained to use emergency response equipment such as fire extinguishers, first aid equipment and snakebite kits.
- Each Contractor should prepare an Emergency Response Plan (ERP) or be guided by the ERP prepared in this ESA. The contents of ERP should be well known by all personnel who are responsible for its execution.
- Appropriate safety signage should be posted throughout all construction sites and along roadways that are occupied for construction activities so as to forewarn road users.
- All light and heavy-duty equipment and vehicles should be properly maintained and be in good working condition so as to comply with the national road fitness/safety requirements and manufacturer's safety recommendation.
- Passengers should not be permitted on mobile equipment unless they are being trained to operate the machine or are required to ride on it as an unavoidable part of their duties, provided it is safe to do so.
- Potable water should be provided for all employees at all worksites, thus reducing the possibility of illnesses caused be exhaustion and fatigue.
- All vehicles and equipment traversing the roadways should do so with full compliance of the traffic rules and signage.
- Illegal electrical connections should be identified and flagged with high visibility ribbons prior to the commencement of daily works. These connections should be reported to the necessary authorities for appropriate disconnection/removal.
- All COVID 19 safety protocols should be observed in keeping with national guidelines. Any change in the national guidelines should result in the immediate change in the SOP as it relates to onsite safety protocols.

7.5.2 Public safety

The following are measures which can be implemented to minimize harm to both project personnel as well as the general public:

1. Members of the community should be engaged prior to the commencement of works and made aware of the risks presented by the works and the precautionary measures that they should abide with.
2. All hazardous areas should be secured to prevent access to unauthorized personnel, especially those who are visiting out of curiosity.
3. Warning signs should be installed in areas which present a risk for incidents to occur, including advance warning signs.
4. All work areas should be demarcated, including material stockpiles.
5. Construction sites should be equipped with lights and reflective material at nights.
6. Where accesses to properties are affected, a safe alternative access should be provided.

7. Vehicles passing through communities should not exceed the stipulated speed limit and drivers should exercise extreme caution.
8. Contractors should ensure that all vehicles and heavy-duty equipment are in a full functional state prior to its use on the roadways, within and outside of the project area;
9. Contractors should ensure that all trucks transporting materials are equipped with adequate measures for strapping onto the bunkers.
10. It should be recommended that materials be delivered to the various project sites during off-peak hours. This way, offloading can be done in a timely manner without compromising the flow of traffic.
11. All trucks should be well equipped with a rotating amber light on top of the cab so as to improve visibility to other road users.
12. Appropriate cautionary signs should be placed at the project access junction which connects to the main road along the West Bank of the Demerara River so as to forewarn drivers of ongoing construction works.
13. All drivers and operators must be licensed in accordance with the Laws of Guyana and have the requisite experience and training.
14. All drivers and operators should be equipped with the necessary PPE, especially dust mask which is necessary when traversing dusty roads during dry weather, this will also aid in minimising the risk of contracting the coronavirus.
15. Trucks should at no time carry more that their normal carrying capacity.

8.0 ESMP IMPLEMENTATION FRAMEWORK

8.1 Introduction

The ESMP outlined in Chapter 7 has recommend measures to be implemented to ensure that the potential impacts of the project are prevented or minimised. CHPA has the overall responsibility of ensuring that the recommended measures are implemented. This Chapter outlines a framework for the implementation of the measures recommended in the ESMP and to ensure compliance with the requirements of the IDB.

8.2 Management Structure and Environmental Responsibility

A multi layered management system is recommended to ensure compliance with the occupational health and safety, environmental and social requirements, with responsibilities designated at the different levels, including roles for the CHPA's Projects Division and the contractors.

As was previously indicated, CHPA has the overall responsibility of ensuring compliance. CHPA, within the Projects Division, has an HSE Unit which will oversee the environmental and social aspects of the project. The Unit will be responsible for ensuring the national environmental requirments and IDB's Safeguard Policies are complied with, that the contractors adhere to the requirements set out in the ESMP, and that the recommendations outlined in the ESMP are implemented. The CHPA will assign an Environmental and Social Technical Officer from the HSE Unit to the project. Oversight will also be provided by the HSE Unit Manager, CHPA's Engineers, Clerk of Works and representatives from the IDB.

Implementation of the environmental and social requirements is the responsibility of the contractors. The contractors will be required to have as part of their team an Environmental and Social Personnel. This individual will be required to:

- conduct training of workers in health, safety and environment requirements;
- liaise with CHPA's Environmental Unit on compliance;
- implement the requirements of the ESMP;
- monitoring of construction site for compliance with the requirements and ensure corrective actions are implemented;
- conduct joint monitoring with CHPA Environmental team;
- conduct environmental monitoring required to be conducted by the contractor, as outlined in the Monitoring Plan.
- address any grievances of stakeholders;
- report on environmental and health and safety compliance; and
- oversee the clean-up and decommissioning of the worksites upon the completion of works.

An outline of the HSE Management Structure is presented in Figure 8-1.

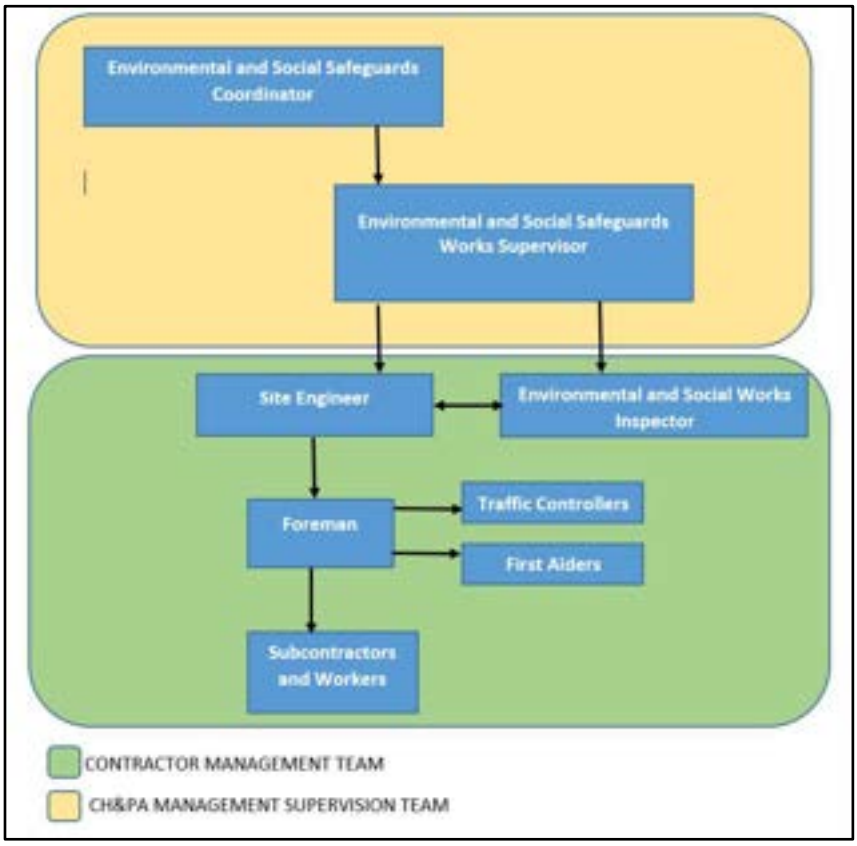


Figure 8-1: HSE Management Structure

The contractors should prepare and implement a Construction Environmental and Social Management Plan (CESMP) to address environmental, social, health and safety issues pertinent to the construction phase of the project and which will also apply to any sub-contractors engaged. This CESMP is to be submitted to the CHPA prior to the commencement of works. The CESMP should be reviewed and updated periodically. Once approved, the CESMP is expected to be fully implemented during the construction period. Preparation of the CESMP should be guided by this ESA and ESMP and relevant national standards and guidelines including those of the CHPA and IDB. The following should be addressed/included in the CESMP:

- Contractors Management Structure
- Contractors Work Programme
- Solid Waste Management
- Liquid Waste/Wastewater Management
- Hazardous Waste Management
- Hazardous Materials Management
- Erosion and Sedimentation Control
- Dust Control
- Noise Prevention
- Workers Health and Safety
- Community Safety
- Traffic Management
- Workers Code of Conduct

- Emergency Preparedness and Response Plan
- Chance Find Procedure
- Training for Workers
- Site Closure, Decommissioning and Restoration
- Stakeholders Engagement
- Grievances
- Monitoring and Reporting

8.3 Institutional Strengthening

The development and proposed implementation of the ESA and associated ESMP is guided specifically by the IDB policies and by the Programme's Environmental and Social Management Framework (ESMF), and Section 8 of the Programme's Operating Regulations (also referred to as the Operating Manual).

The CHPA has been designated the Executing Agency and is, in effect responsible for the successful implementation of the AHUAP – GYL1031. This responsibility includes meeting the environmental and social demands of the Programme. In addition, one of the special contractual conditions for execution is that "*throughout the life of the Project, the Executing Agencies shall implement and comply with the ESMF and ESMP, and shall cause every contractor, operator or any other person perform the Project related activities to design, build, operate, maintain and monitor all activities in accordance with the ESMF, integrated in the Operating Manual*"

Considering the multi-fold environmental and social aspects of the AHUAP, the CHPA's Project Management Team includes five Environmental and Social Specialists (an HSE Manager and an four Environmental and Social Technical Officers) to improve its environmental management capacity. While this has improved the CHPA's environmental management capacity, additional efforts should be made to increase the capacity and awareness at the level required to foster the required corporate awareness. As such, the following can be considered:

1. Certification of engineers on environmental and social matters;

2. Sensitizing and informing the senior management level on environmental and HSE matters;

3. Implementing a comprehensive Public Relations (PR) information campaign on the programme. In this context, experiences with previous projects suggest that the PR Department should be more actively involved in crafting and executing a PR program to facilitate community awareness and participation in the construction;

4. Given the multitude of project being undertaken simultaneously by the CHPA it is recommended that the HSE Unit be adequately staffed with environmental and social safeguards technical personnel to ensure that there is adequate HSE Management of the project.

5. The HSE Unit has procured several pieces of Environmental Testing Equipment, namely a Noise Level Meter, an Air Quality Monitor, and a Water Quality Meter for use under the Programme. It is recommended that an Environmental Officer be employed specifically for the undertaking of Environmental Testing throughout the project sites to verify the contractors' environmental testing results. Given the existing responsibilities of the

Environmental and Social Works Supervisor and the likelihood of concurrent project sites, it is unlikely that this personnel would be able to undertake such tasks effectively.

8.4 Communication of Environmental and Social Requirements to Bidders

In executing the project, the Contractors are required to comply with all national regulatory requirements and best practices, and ensure activities are in compliance with the safeguard policies of the IDB. The Contractors are required to implement the mitigation measures outlined in this ESMP. Other applicable measures recommended by CHPA are also to be implemented. The Contractors are required to cover all cost relating to the environmental, social, health and safety requirements. As such, it is imperative that these requirements be clearly communicated in all tender documents. This will ensure that potential contractors are aware of what is required and include the necessary resources, including personnel and funds, to ensure compliance.

8.5 Training

Prior to the commencement of works the Contractor shall conduct an Induction Training for all workers. The training should be conducted by the Contractors' Environmental and Social Personnel and covers the environmental and social requirements of the project, including the role of workers in pollution control, health and safety and emergency response. Thereafter, all new workers should be adequately briefed on the requirements prior to commencing work onsite. If necessary, refresher training may be conducted. Specific areas to be targeted in the training of workers should include:

- Construction Environmental and Social Management Plan
- Workers' Code of Conduct
- COVID 19 and other infectious diseases Precautionary Measures
- Use of Personal Protective Equipment
- Transfer and Storage of Hazardous Materials
- Spill Prevention and Response
- Waste Management
- Emergency Response Equipment and Measures

The Contractors' Environmental and Social Personnel should also conduct regular toolbox session with small groups of staff. This is recommended at least once per week of twice per month. Daily toolbox session could also be conducted by the contractors' engineers or supervisor prior to the commencement of works at the start of each day.

8.6 Monitoring

To ensure compliance by Contractors, monitoring of the construction activities will be conducted by CHPA Environmental Unit. Visits to each worksite will be conducted at least once per week to determine the level of compliance by the contractors. Non-compliances will be identified during these monitoring visits and corrective actions will be recommended.

The contractors are also required to monitor the implementation of the mitigation measures to ensure the works do not negatively affect the environment and that the health and safety of workers, residents and other stakeholders are not compromised. Monitoring is the responsibility of the contractors' Environmental and Social Personnel with support from other senior members of staff. Once non-compliances are detected corrective actions are to be implemented. The implementation

of corrective actions should be done within an agreed timeline. The Contractors are also required to conduct monitoring in accordance with the Monitoring Plan outlined in Table 8-1.

Table 8-1: Monitoring Plan

Environmental Components	Indicators	Monitoring Schedule
Soil	• Compacted/disturbed land • Erosion • Contamination	Weekly
Water	Visual Observations for: • Discoloration • Sedimentation • Contamination • Unobstructed flow	Daily
	Testing for[9]: • Turbidity • pH • Dissolved Oxygen • Phosphates • Nitrates	Monthly
Noise	Noise levels impacts on workers and surrounding community	Daily
	Measuring decibel levels	Monthly
Air Quality	Dust generation	Daily
	Particulate Matter Testing	Monthly
Community Relations	• Dispute • Grievances • Encumbrances	Weekly
Health & Safety	• PPE available • PPE used by worker • Reduction in incidents • Emergency response measures in place • Hazardous areas identified and restricted • Traffic management and control in place • Signs installed • Sites demarcated/cordoned off • Sites lighted	Daily
Waste Management	• Garbage collection receptacles provided and used by workers. • Waste properly disposed. • No significant accumulation of construction waste.	Weekly

[9] If levels of phosphates and nitrates exceed acceptable levels the testing for faecal coliform should be done.

Environmental Components	Indicators	Monitoring Schedule
Livelihood	• Accesses to residents and business maintained • Damage to property • Loss of income	

8.7 Reporting

The Contractors should report on environmental, health, safety and social compliance at progress meetings or any such engagements. A monthly report should also be prepared on environmental, health, safety and social compliance and submitted to the CHPA. This report could either be prepared as a separate document, or submitted as a component of the contractors' monthly reports. The format for this report should be agreed between the contractors and CHPA and should be presented in the CESMP. The monthly reports should include but not limited to the following:

- Environmental incidents or non-compliances observed and corrective actions taken with regards to waste management, contamination, noise and dust control, traffic management, etc.;
- Health and safety incidents, accidents, injuries and all fatalities that require treatment and actions taken to improve conditions.
- Information on number of workers, work hours, PPE provided and usage, training provided and worker violations and follow-up actions taken (if any);
- CESMP implementation progress, including implementation of the management and mitigation measures outlined in the plan, effectiveness of the measures being implemented, any emerging HSE issue and any adjustments required (if any); and
- Grievances by workers and community, including grievances received, how resolved, those unresolved and plan for resolving these.

The Contractors should also be required to report on any environmental or health and safety incidents which might occur. Separate reports should be prepared for accidents or incidents which have occurred on the project site. These reports should outline details as to what occurred, response measures, outcomes/actions taken to resolve same and management measures implemented to prevent future occurrences. However, any fatality should be reported immediately and any serious (lost time) injury and significant adverse effects or damage to private property or to public utilities should be reported within 24 hours. Full detail of such incidents should be submitted within an agreed timeframe. An accident/incident register should be kept by the contractors.

CHPA will be required to prepare any required environmental and social related reports, including reports which may be required by the EPA such as Annual Environmental Reports, or reports which are to be submitted to the IDB, such as the Semi-Annual Progress Reports. The EPA has established guidelines on the preparation of Annual Environmental Reports. The status of project's environmental and social compliance is to be discussed as a component of that report.

8.8 Stakeholder Engagement Plan

Stakeholder engagements were conducted as part of the ESA preparation process. During project implementation CHPA should continue to engage with the community regularly to provide updates on Project progress and activities and also to hear concerns based on project activities. In this

regard, this Stakeholder Engagement Plan (SEP) was prepared. The SEP presents the details for the conduct of the engagements based on as the project progresses. Stakeholder engagements will familiarize local stakeholders with the project's activities, the measures being undertaken to protect the environment, provide a platform for concerns to be raised and to lay the foundation for a positive relationship between the project and the community. The SEP aims to conduct engagements that provide a means to take all viable views of project stakeholders into account to improved project design and implementation, thereby avoiding, or reducing adverse impacts, and enhancing project benefits. The process should also be guided by the IDB Policy Directive B 6.

8.8.1 Engagement Approach

The stakeholders should be engaged in a transparent, systematic, and non-discriminatory manner towards maximizing numerous benefits to the project. These include but are not limited to:

1. Enabling people to understand their rights and roles in relation to a project leading to greater transparency and involvement of stakeholders by enhancing their trust.
2. Building the credibility and legitimacy of the institutions involved, whether in an implementing or supporting role.
3. Promoting project acceptance, and local ownership, which are key to project success and sustainability.
4. Informing stakeholders of any significant changes to the project that can result in additional risks and impacts of concern, specifying how those risks and impacts are being addressed.
5. To report complaints and grievances incurred during the execution of the project.

The stakeholders to be engaged during the project implementation are resident, businesses, civil society organisations, religious organisations, schools and other community groups from the communities falling within the project's area of influence or beneficiary communities. These communities are:

1. Peter's Hall
2. Providence Phase 2 (North and South)
3. Perseverance
4. Herstelling
5. Farm (Phases One and Two)
6. Covent Garden

8.8.2. Engagement Methodology

The success of the public engagement of the project stakeholders is rooted in honest, open, and meaningful dialogue early and often throughout the course of a project. The group of primary stakeholders stand to be mostly affected by the project mainly due to proximity in daily interactions with the project environment. CHPA is expected to ensure that stakeholders, particularly affected communities, are provided with timely and transparent information regarding the Project, and to voice potential issues of concern emerging from the project.

A project pre-start up meeting should be held with the relevant stakeholders, informing them of the plans. This can be more effective if done separately for each lot to be worked on. Thereafter, regular engagements should be done, at least quarterly. Prior notice should be given to the community for any public meetings to be held at least 10 days prior to the event. One on one engagements should also be considered, in addition, dissemination of information such using flyers and interview sheets

should be considered. Information which can be included are project Fact Sheet with relevant contact numbers, Project Summary, Frequently Asked Questions, and GRM. Information should be provided at least 10 days prior to the event.

CH&PA will keep detailed notes of all engagements with minutes held for the quarterly meetings. Signed attendance sheets will be required to record participation along with images of each session. Notes will be taken of taken of the individual meetings and images will be requested from the stakeholder to serve as a guide to the process and further evidence of the event.

8.9 Grievance Redress Mechanism

A Grievance Redress Mechanism (GRM) for stakeholders is to be established to facilitate the complaints and concern for all stakeholders, including those who are directly affected by project activities. It is to be designed so as to address concerns promptly, using an understandable and transparent process, and enforce measures to protect personnel from reprisal for its use. A well-functioning grievance mechanism provides a transparent and fair process to all parties without any bias to the CHPA or contractors. All stakeholders who believe aspects of the project will have a detrimental impact on their community, their day-to-day activities, the environment, or on their quality of life should be able to communicate their grievances. These grievances should be documented, analysed and responded to efficiently. Stakeholders may also submit comments and suggestions that they feel will increase the benefits of the project and decrease the impact they face. It is expected that any grievances arising from the construction activities will be localized. As such, to ensure that the process is effective, a site level mechanism to address grievances is recommended.

The GRM does not impede access to judicial or administrative remedies that is available under law or other avenues to submit complaints. Affected parties can escalate their complaints if they consider that the GRM is not the appropriate space for their complaints, or if their claims were not addressed to their satisfaction.

The contact information for affected persons to submit their complaints will be incorporated into the GRM, once the information becomes available. This information will include the Responsible Person, Address, Telephone Number, Text Message Number and Email Address. The GRM should be posted around the community at strategic locations, and communicated to stakeholders at any community meeting.
A register of grievances received should be maintained by the CHPA and should include information such as date of complaint, by whom, nature of grievance, date investigated and by whom, validity and corrective action(s) required, timeline for implementation of corrective action, and if grievance was satisfactorily addressed or not. A monthly review on the status of grievances received/addressed should be conducted by the CHPA.

The Environmental Unit of the Project Department of the CHPA should manage the grievance redress process. All grievances should be address in a timely manner, with timelines set for each aspect of the process. Timelines for addressing grievance are proposed in Table 8-2. Once any grievance resulting from the execution of works is received the following actions should be undertaken:

- The CHPA Environmental Personnel, along with the Contractor Project Manager/Environmental Personnel, should investigate reported grievances to determine the validity of a complaint and cause for the grievance;

- It should then be determined whether grievance can be resolved by the Project Team or whether outside authorities with regulatory or other responsibilities and relevant skills are to be consulted;
- Or it should be determined if corrective actions are to be taken by the Contractor and what those actions are;
- The CHPA Environmental Personnel should prepare grievance report, including supporting materials such as photographs. If necessary, a clear list of tasks and outcomes expected shall be developed;
- If grievance is the fault of the Contractor, then the Contractor is to implement corrective action immediately.
- The CHPA Environmental Personnel, along with the Contractors Project Manager/Environmental Personnel should conduct follow-up inspection to monitor the situation and determine whether problem is likely to recur and put measures in place to prevent recurrence.

Table 8-2: Grievance Redress Procedures

GRIEVANCE PROCEDURES	TIMELINE
Receiving and registering the complaint.	1 day
Determine merit of the complaint and acknowledgement of complaint	2 days
Investigation of complaint	5 days
Determination (and approval) of appropriate solution/response	1 day
Communication on the resolution back to the complainant	1 day
Receive and acknowledgement of appeals by aggrieved party (where solutions are not satisfactory)	2 days
Activate arbitration mechanisms where necessary	1 week
Resolution of Issue	1 week
Updating of Grievance Log	1 day

In addition to the project level GRM, a safe and ethical process for reporting, investigating, and addressing allegations of Gender Based Discrimination, Gender Based Violence, Sexual Exploitation and Abuse and Sexual Harassment (GBV/SEA/SH) and Persons with Disability should be established.

8.10 Emergency Response

Even though the contractors may have implemented proper systems and are complying with all the environmental and occupational health and safety requirements to ensure a safe and healthy work environment, occasions can still arise when an environmental emergency can occur. In the event of an emergency, the objectives are to ensure a prompt and effective response by the company, as well as to minimize the effects. In this regard, this Emergency Response Plan (ERP) was prepared. The ERP describes the general types of emergency and actions to be followed, should an emergency occur during the construction phase of the project. The ERP includes:

- Emergency Contact Details;
- Emergency Procedures;
- Description of an Emergency;
- Authority of Control;
- Scenario Description and Response;

- Materials Inventory; and
- Incident Reporting.

It is advisable that contractors prepare their own ERP, utilising this for guidance. The contractors ERP should be provided to employees and placed at strategic locations within each project sites. Such locations will include the office, living quarters and work zones.

In any ERP, it is critical that the workers be adequately trained and there should be detailed emergency procedure drills and briefings. Training should be done to make staff aware of the dangers of the workplace, as well as the appropriate management measures to be implemented in cases of emergencies. All personnel should benefit from training and orientation and should be familiarized of the potential hazards of their work area and to take the necessary precautions to prevent these from occurring in the course of carrying out their duties, as well as to follow good housekeeping practices to prevent accidents, fires and other emergencies.

8.10.1 Objectives of Emergency Response

The emergency response objectives include:

1. Protection of human health and safety;
2. Protect and minimize the effect on the environment or property;
3. Contain the spread of material;
4. Neutralize and render safe any noxious or hazardous materials; and
5. Commence clean-up activities and site remediation.

By their very nature, emergency response procedures deal with events either not foreseen or almost totally unlikely. It is necessary therefore to plan for worst case scenarios or adopt general procedures, as normally anything that can be covered by a specific plan is not an emergency. It is important to recognize that, although highly unlikely, an emergency can have serious impacts well beyond the individual operation immediately involved.

8.10.2 Identification of an Environmental Crisis

An emergency is a situation in which injury to a person(s) and/or damage to the environment or property is involved thus requiring emergency service attendance. An environmental emergency would involve widespread actual or potential destruction or contamination of the environment that calls for immediate action. Given the nature of the project, no major emergency is foreseen. Some examples of events that would require the instigation of an emergency response procedure at the project location include:

1. A fuel and or oil spill;
2. Fire; and
3. Minor and major accidents;

8.10.3 Emergency Contact Details

The contact information for institutions and agencies to be contacted in a case of emergency are outlined in the Table 8-3. These institutions are either relevant to the project activities or its location.

Table 8-3: Emergency Contact Information

Emergency Contact Numbers		
No.	**Organization**	**Contact Number**
1	Georgetown Public Hospital Cooperation	227-8210-2, 227-8204-7227-8241-7
2	Diamond Hospital	265 4681-5
3	Diamond Fire Station	216-2162
4	Eccles Fire Station	233-5700
5	Grove Police Station	265-2233
6	Providence Police Station	265-7383
7	Mocha Police Outpost	263-6082
8	Ministry of Labour	227-3133
9	CHPA	225-4810
10	EPA	225-0506

8.10.4 Authority of Control

The staff structure should comprise the Site Engineer, who reports directly to the contractor. This personnel should be responsible for the day-to-day execution of works at the project site. Environmental and Health and Safety support should be provided by means of a specialist who will advise on specialized areas. The Site Engineer should have the authority to take control of any incident and can make a decision to close down all or any part of the operations following an incident. This person should also decide on the type and level of response required for a particular emergency.

8.10.5 Emergency Response Equipment

Contractors should maintain stocked and adequate First Aid Kits onsite. These kits should be located in a central area and clearly labeled. The contents of the kits should be consistent with what is recommended by the Red Cross and should be accompanied by proper instructions on usage. However, proper medical services are available at the Diamond Hospital, which is approximately ten minutes away from the project location. More advanced medical services are also available at Georgetown Public Hospital Cooperation (GPHC), approximately twenty minutes away. These should be utilised for more severe situations.

Firefighting equipment such as fire extinguishers and sand buckets, along with instructions on their usage, should be located at strategic points at the construction sites. These points should be clearly marked, being visible at all times, and employees should be aware of their positions. Dry chemical extinguishers should be acquired. Staff should be trained in fire response and how to operate fire response equipment available onsite.

Fuel should be stored in limited quantity in sealed metal drums and kept in an enclosed area with on impermeable base. In the case of a spill occurring outside of this area, a Spill Kit should be kept onsite to assist with the clean-up.

8.10.6 Response Mechanism

Emergency response measures should be applied to both minor and major incidents/accidents. Adequate information and equipment should be maintained onsite to respond to emergencies. The following outlines the emergency response procedures for several types of emergencies that may occur during the project implementation.

8.10.6.1 Minor Incident/Accident

In the event of a minor accident, the Site Engineer or Foreman should be informed and should then take the responsibility for on-site treatment utilizing First Aid facilities. The contractor should consider training personnel in First Aid if none of the employees hired had prior training. An entry should be done into the Accident and Emergency Record book which is to be kept on the project site at all times.

8.10.6.2 Major Incident/Accident

In the event of a major accident the following measures should be implemented:

- Inform the Site Engineer or Foreman.
- Assess type of injury, i.e. broken leg, conscious or unconscious.
- In the case of injury, First Aid treatment to be applied.
- Arrange transportation to Diamond Hospital or the Georgetown Public Hospital if case is serious.
- Make entry into the Accident and Emergency Record book.

As was previously stated the Diamond Hospital is in close proximity to the project site. This hospital is fully equipped to handle most accidents such as bruises, broken bones, cuts, etc.

8.10.6.3 Fire

Fire-fighting equipment such as fire extinguishers and sand buckets should be located at strategic points within the project area such as fuel storage area with instructions on their usage. These points should be clearly marked, be visible and employees would have knowledge of their position. In the event of a fire, employees should initiate the following procedure which they would be familiar with as a result of fire drills:

- Immediately warn others and evacuate area.
- Attack the fire if safe to do so, with fire-fighting equipment provided, but without taking personal risks.
- Take decisions on containment. If it is a small fire, use fire extinguisher. In the event of a larger fire, employ water spray if water pump is available on site. Also contact the Guyana Fire Service.
- Contact the site Environmental and safety Personnel.
- Make entry into the Accident and Emergency Record book.

8.10.6.4 Fuel Spills

If fuel is stored on-site for refueling of equipment, it should be located within a containment area that has an impermeable base. However, in the event of a spill beyond or outside the containment area the following action should be taken:

- Attempt to stop the flow if possible.
- Inform the contractor Environmental Personnel and seek guidance.
- Prevent the movement of people or vehicles into restricted area.
- Treat spill with absorbent materials such as sand or sawdust and a bund formed if possible to prevent the spill spreading and contaminating the waterways and soil.
- Collect absorbent materials and place in a secured area with an impervious base at a restricted zone.
- Make entry into the Accident and Emergency Record book.

8.10.7 Incident Reporting

After every incident/accident a report should be required. The contractor Environmental Personnel should have direct responsibility for the preparation of such a report. The following is a format, which can be used.

(Name of Construction Company)
Record of Accident/Incident
ENVIRONMENT, SAFETY & HEALTH MANAGEMENT INFORMATION

TO BE COMPLETED BY HEALTH, SAFETY AND ENVIRONMENTAL OFFICER

1. Reason for Record: ☐ Accident ☐ Incident
2. Name: _____
3.Position:_____
4. Date of Birth: _____ 5. Sex: ☐ Male ☐ Female
6. Date of Accident/Incident: _____ Time: _____ ☐ AM ☐ PM

7. Duty Station Address:	8. Location of Incident:
9. Description of Accident/Incident	
10. Extent of injury or illness and Body Parts Affected:	
11. Medical Treatment? ☐ Yes ☐ No	12. Lost Time? ☐ Yes ☐ No
13. Description of Treatment:	
14. Follow-up Acton:	

Signature: _____ Date: _____
Title: _____

Figure 8-2: Suggested Format for Incident Reporting

9.0 Public Disclosure

The ESA report will be disclosed by the CHPA with support from the Consultant in accordance with the IDB's requirements. It is anticipated that the ESA prepared by the Consultant will be reviewed by the CH&PA and subsequently be published on Agency's website. Public disclosure/consultation meetings are also expected to be held with stakeholders of the project, including the communities which may be impacted during the execution of the AHUAP in the program area.

The purpose of the disclosure process and engagements are:

- To inform the stakeholders and residents on the nature, goals and scope of the project, including the upgrade interventions expected as a consequence of the AHUAP;
- To discuss the potential positive and negative environmental and socio-economic impacts related to the works;
- To present the recommended mitigation measures; and
- To gather their feedback, including concerns and recommendations so that these can be addressed in the revised ESA.

Prior to the engagements, discussions will be held between the CHPA Community Development Department and the Consultant to determine the most effective way of disclosing the ESA. Multiple sessions would be held targeting different stakeholder groupings, and consisting of both virtual and onsite gatherings.

The ESA/ESMP should be disclosed at least 10 days prior to meetings with stakeholders. In addition, as much as possible, copies of the ESA report should also be shared before the meetings with stakeholders in order to enhance the knowledge about the project characteristics and facilitate informed discussion on the different aspects. Further, simplified and summarized key information should be shared with stakeholders in the form of brochures, flyers, etc.

It is expected that at each of the meetings, an overview of the purpose of the meeting will be presented by CHPA along with a presentation on the project, including the works to be conducted, timelines, areas targeted, etc. Thereafter, the Consultant will present the findings of the ESA, including potential impacts determined and the recommended mitigation measures. The meetings will then open for stakeholders to participate in the discussion by airing any concerns, seeking any clarifications, and making recommendations.

The feedback relating to the ESA from each meeting will be documented and the relevant issues and concerns raised and recommendations provided will be addressed in the revised ESA. A Consultation Report will also be prepared and disclosed by the CHPA.

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APPENDICES

ANNEX 1: Completed Environmental and Social Screening Checklist

Government of Guyana
Ministry of Housing and Water
Central Housing and Planning Authority
Adequate Housing and Urban Accessibility Programme (AHUAP)
GY-L1031

E&S Checklist for Scoping Study as part of the Environmental and Social Assessment (ESA) Study for La Parfaite Harmonie Housing Area

E&S CHEKLIST- IDENTIFICATION AND EVALUATION OF POTENTIAL ENVIRONMENTAL IMPACTS

References for reading the identification table and evaluation of potential environmental impacts:

Impact	Sign of the Impact	Intensity	Magnitude
Y / N	**+ / -**	**H/ M / L**	**H / M / L**

Impact (iM): Identification of significant effect of Project actions.
Y: if it affects,
N: it does not affect.

Sign of the Impact (SiM):
sign +: positive effect on the environment
sign -: negative effect on the environment

Intensity (I):
Severity of an impact based on the degree of environmental quality modification.
Qualitative categories: H = high, M = medium, L = low.

Magnitude (M): Area of influence of the affectation. Qualitative categories:
H = high, it affects the whole neighborhood and the environment;
M = average, affects a sector of the neighborhood;
L = low, the effect is circumscribed to a specific space within the neighborhood.

ENVIRONMENTAL IMPACTS

1. ECOSYSTEMS AND CULTURAL HERITAGE
   1.1. Could the project affect sites of particular ecological value?

Response

No, it is very unlikely that the project will have any significant impact on any particular site of ecological value. Based on preliminary studies done, the project sites are located in a highly populated urban area along the East Bank Demerara. These lands were previously used for the cultivation of sugar cane and have been recently developed to accommodate housing, therefore there is loss of wilderness. With loss of wilderness there is low ecological value. Additionally, areas with high anthropogenic activities are synonymous with low biodiversity and species limited to those areas are usually common to the region and are less sensitive to human impacts.

1.2. Could the project affect any natural feature of the site or adjacent area? (topography, bodies of water, rivers, vegetation, fauna, etc.)

Response

No, the project will not affect any natural features of the sites or areas adjacent to it since all project activities are limited to rehabilitation and improvement works done to existing infrastructure.

1.3. Would there be effects on sites of historical, archaeological or cultural value?

Response

No, there would be no effects on sites of historical, archaeological or cultural value. No such sites were identified during the scoping exercise. As noted, these lands were previously used for the cultivation of sugar cane and have been recently developed to accommodate housing

2. WATER RESOURCES

2.1. Could the project modify the depth of the groundwater?

Response

No, there is no evidence to suggest that the project will have any impact on the depth of the groundwater.

2.2. Could there be alterations in the quality of the usable underground water?

Response

Yes, a project of this nature could have minor negative impacts on groundwater resource. There is a high probability of construction works causing damages to underground mains which provides potable water to residences within these communities. In addition, project activities that involves the relocation or rerouting of water distribution lines could directly impact the quality of groundwater. In such cases, pipelines which becomes damaged or broken or are generally being replaced can serve as entry points for contaminants which, during low pressure, could be fed back into the aquifers. This could therefore compromised the quality of groundwater within the area. While there is a possibility of this impact occurring, the likelihood is low due to the sparse distribution of works. In addition, it is common to find existing leaks throughout the project sites.

2.3. Could the project cause a decrease in underground water resources due to deviation of flow rates, waterproofing of surfaces or local consumption?

Response

No, the project will not cause a decrease in underground water resources due to deviation of flow rates or waterproofing of surfaces. This is due to the fact that the project is limited to rehabilitation works of existing infrastructure. However, at the end of the project, there may be an increase in occupancy rate which could increase the demand for potable water which is usually provided from underground sources.

2.4. Could the project modify the sediment load in surface waters?

Response

Yes, the project will significantly modify the sediment load in surface water since most of the existing drains that are directly within the work zones will be re-established by means of cleaning/excavation and in some cases replaced with reinforced concrete drains. In fact, it should be noted that the current condition of the drainage networks, which accounts for the main surface water bodies within these communities, is deplorable and in some cases non-existent, due to heavy siltation and vegetative growth. In some cases, the drains are used as dumping grounds for domestic garbage. In this regard, the project will have a positive impact on the surface water quality, particularly activities which involves re-establishing the drainage networks within these communities. Thus, the potential issues of siltation are expected to be short term and not anticipated to be a significant impact.

2.5. Could the project modify the quality of the water resource in cases of graywater discharge in storm drainage system?

Response

Yes, during the construction period there will be effluent or liquid waste, particularly blackwater and greywater which will be produced from temporary office and worksite facilities. If these are allowed to drain directly into the nearby waterways, it can have negative effects on the water quality. This impact is also likely to intensify during the operational phase, as the development will motivate persons who have not yet occupied their lands to do so.

2.6. Could the project affect the quality of the water resource by discharging wastewater into receiving bodies?

Response

Yes, the project could affect the quality of the water resource by discharging wastewater into receiving bodies. During the construction period there will be effluent or liquid waste, particularly blackwater and greywater which will be produced from temporary office and housing facilities. If these are allowed to drain directly into the nearby waterways, it can have negative effects on the water quality.

2.7. Could the project affect the provision of drinking water for other users?

Response

Yes, the project could in fact affect the provision of drinking water for other users, since there is a probability of construction works causing damages to underground mains which provides potable water to residence within these communities. Also, relocation of rerouting of water distribution lines could directly impact the quality of groundwater. While there is

a high possibility of this impact occurring, it should be noted that such an issue currently exists in each of the six communities within the project area and to a larger extent, external communities. In fact, it is common to find existing leaks throughout the projects area.

3. DRAINAGE

3.1. Does the storm drain network modify the current drainage conditions?

Response

Yes, the current drainage conditions will be modified. Additional culverts will be constructed in order to enhance the drainage network so as to allow better flow and channelling of water into larger water bodies. Existing drains will also be enhanced.

3.2. Does the project modify the collection of drainage in the basin corresponding to the neighborhood?

Response

Yes, the project will modify the collection of drainage in the basin corresponding to the neighborhood. Several culverts will be constructed to interconnect drains and canals so that there will be a constant flow and drainage of storm water in multiple directions.

3.3. Does the project modify the exit of the drainage in the basin corresponding to the neighborhood?

Response

No, there will be no modification to the exit drainage. No external structure or drainage outside of these communities are targeted for intervention under the project.

3.4. Will the drainage system be affected by sediments, due to erosion caused by runoff water?

Response

Yes, the drainage system can be affected by sediments, due to erosion caused by runoff water. Construction materials could be eroded into nearby drains during periods of heavy rainfall. Eroded materials can be transported into the waterways via surface runoff and can increase the turbidity of surface water bodies and at the same time result in sedimentation and discolouration.

3.5. Would there be an increase in erosion, due to water coming from drainage?

Response

It is not expected that water coming from the drainage will contribute to any significant erosion.

3.6. Was there a risk of flooding from other sectors adjacent to the site as a result of the project?

Response

Yes, flooding can occur from the ongoing highway construction works which will eventually connect these villages within the project area if main drainage bodies are blocked for long periods.

3.7. Does the drainage network guarantee that ponds or puddles of still water are not created?

Response

Yes, to a greater extent the drainage network will guarantee that ponds or puddles of still water are not created. Due to the flatness of the coastal lands, all drains are designed and created to a particular gradient that allows smaller drains to drain into larger ones, which eventually flows into main drainage canals, which discharges in to the Demerara River. Additionally, the project caters for the construction of several culverts which will also be beneficial in preventing such a situation from occurring, as it will increase connectivity, which will allow drains that are currently stagnated to flow freely.

3.8. When carrying out consolidation activities, waterproofing of soils or elimination of vegetation cover, will there be a risk of altering the degree of infiltration?

Response

Yes, there will be some level of alteration to the degree of infiltration since the roads will be upgraded from sand based surfaces to asphaltic concrete surfaces, which prevents penetration and increases the rate of runoff, hence reducing the rate of infiltration.

4. USES

4.1. Could the project affect or modify the current land use?

Response

The project will be focusing only on rehabilitation and upgrading of existing infrastructural works within these communities. As such, there will be no interference with land uses throughout the construction phase. In this regard, no impact to land use is envisaged. However, in the long term, the project could have a positive impact on the socio-economic structure of these communities, as they would become more favourable to inhabit, hence increasing the occupancy rate which would see the establishment of more residences and businesses.

4.2. Could the project affect or eliminate adequate land for agriculture or forestry production?

Response

No, the project will not affect or eliminate adequate land for agriculture or forestry since it will only be focusing on rehabilitation works to infrastructure within existing communities. No new lands will be developed.

4.3. Will the project have spaces for the allocation of green areas?

Response

Not applicable, since the project focuses only on the rehabilitation of infrastructure within existing communities.

4.4. Does the project include afforestation of public spaces?

Response

No, since the project focuses only on the rehabilitation of infrastructure within existing communities.

4.5. Does the planned lot in the project include spaces for family productive activities?

Response

Not applicable, since there will be no new land development. However, the project will enhance accessibility to existing public recreational spaces in some of the targeted communities where the roads to be rehabilitated are located within proximity. This is coupled with the construction of sidewalks.

4.6. Could the project affect the use, or access to a space and / or recreation area or green spaces?

Response

Yes, in some cases the project could temporarily affect access to recreational areas, particularly during road construction works. This impact is expected to be short term and not significant since pedestrian accesses could be maintained or alternative access utilised. However, the project will enhance accessibility to existing public recreational spaces in some of the targeted communities where the roads to be rehabilitated are located within proximity. This is coupled with the construction of sidewalks.

4.7. Does the project modify activities of natural extraction of wood, firewood, or burning by the current population?

Response

Not applicable.

4.8. Does the project modify the activity of soil extraction? (abandonment of brickworks, cellars, etc.)

Response

Not applicable

5. LANDSCAPE

5.1. Could the project cause changes in visual characteristics in or near the area through alterations of natural or cultural factors?

Response

Yes, the project will cause changes in visual characteristics in or near areas of intervention. These visual changes will be positive since the project's main goal is to improve the living conditions within these communities and not necessarily alteration of natural or cultural factors.

5.2. Could the project interfere with the view or access to views of natural and / or cultural factors of the landscape?

Response

The project is located in a housing area where development is expected. Some homeowners who would have established themselves in the schemes have accepted access, views and the natural landscape.

5.3. Could the project introduce new materials, colors, and shapes to the immediate landscape?

Response

New materials will be introduced to the immediate landscape during the construction phase, particularly as it relates to the construction of the sidewalks, whereby pavers are expected to be used. These are expected to have a positive impact on the community and will increase the value of the properties in the local neighbourhood.

6. NATURAL RISKS

6.1. Could the project be susceptible to environmental risk (natural origin: floods, earthquakes, landslides) due to its location?

Response

Yes, the project will be susceptible to mainly flood. Guyana has two rainy seasons that can cause severe flooding within coastal areas. Floods are also caused directly by unusually high spring tides or breaches in the coastal sea defence.

6.2. Would there be a risk of flooding from other sectors adjacent to the site as a result of the project?

Response

Yes, there could be a rick of flooding from other sectors adjacent to the site as a result of certain project activities such as culvert and bridge construction, particularly if temporary cofferdams are used. Activities in other sectors that restrict the drainage capability of the project area can negatively affect the project.

6.3. Could the project contribute to creating land sinking problems?

Response

No, the project will not contribute to creating land sinking problems.

6.4. Will the project produce or intensify the erosion of the area?

Response

No, there is not enough gradient for the rainfall to flow overland with the required intensity for soil erosion to occur. During periods of rainfall the rainwater accumulates on the land and in the drainage canals and is drained off by gravity when the sluices were opened during low tides, or pumped by mechanical pumps. This process does not contribute to significant erosion.

1. ANTHROPIC RISKS

1.1. Could the project be susceptible to technological risk due to the presence of high voltage pipelines, gas pipelines, railways, high traffic roads, industrial plants, canals, reservoirs?

Response

No, the project will not be susceptible to any technological risk due to the presence of high voltage pipelines, gas pipelines, railways, high traffic roads, industrial plants, canals or reservoirs since these are not located within the project area.

1.2. Could the project be susceptible to health risk due to the presence of brick kilns, cellars, contaminated landfills, garbage dumps, slaughterhouses, uncontrolled animal husbandry due to its location?

Response

No, the project will not be susceptible to any health risk since none of the listed facilities are located within the project area.

1.3. Could the project be susceptible to technological risk due to pre-existing infrastructure works?

Response

It is not anticipated that the project will be susceptible to technological risk due to pre-existing infrastructure works.

2. WASTE

2.1. Does the project contemplate the management of solid waste?

Response

Yes, a waste management plan will be formulated as part of the Environmental and Social Assessment (ESA) for implementation by the CHPA and the contractors.

2.2. Could the project cause changes in activities related to waste management? (scrap, recyclers, etc.)

Response

Nope, this is not expected since the waste to be generated would be typical garbage, spoils and construction waste.

3. IMPACTS DURING CONSTRUCTION

3.1. Will there be interruptions in surface drainage in the excavation areas?

Response

Yes, there will be short term interruption in surface drainage in the excavated areas. This is likely to occur mainly during the construction of culverts, whereby cofferdams may be used to temporarily block the flow of water from the construction area.

3.2. Will there be interruptions in surface drainage in the filling areas?

Response

No, there will not be any interruptions in surface drainage in the filling areas since these areas comprises existing roads.

3.3. Could the amount of waste and material waste be increased?

Response

Yes, the project will generate waste, waste to be generated includes domestic garbage, which usually consists of a mix of bottles, bags, cans, boxes, plant residues, excess food and kitchen scraps and old clothing and paper. These will mainly be generated by construction staff on a daily basis. Liquid waste will also be generated including sewage waste and waste water from bathing and washing. Hazardous waste to be generated includes waste oil, filters and oil containers. Construction waste is also expected to be

generated in large quantities, particularly from excavation and masonry works, and would include spoils, wood, broken concrete, pieces steel rod, cement bags, etc. these will be loaded onto trucks and taken to the Haags Bosch Industrial Landfill site at Eccles

3.4. During the construction, could excavations and fillings be affected by erosion or other processes?

Response

Yes, there is a possibility that excavation and fillings could be affected by erosion, particularly during the construction of roads and culverts in the rainy season.

3.5. Product from project works could accumulate water in unfilled loan wells.

Response

Not applicable

3.6. Will construction supplies (gravel and fill material) be obtained from existing quarries?

Response

Yes, it is likely that all construction supplies (gravel and fill material) will be obtained from existing quarries; however, this is solely dependent on the individual contractor's choice or preferences in sourcing of material.

4. **SOCIOECONOMIC ASPECTS**

4.1. Does the project contribute to the physical integration of the area into the urban fabric?

Response

The project will contribute to the physical integration of the area into the urban fabric, particularly with the construction of the primary roads which will seek to interconnect some of these communities.

4.2. Does the project meet the demands for infrastructure and community services?

Response

The project will meet some of the demands for infrastructure and community services.

4.3. Could the project influence environmental behavior in the population?

Response

There is a possibility that the project could influence environmental behaviour in the population, since it will improve the general aesthetics or the area. Also, the project will increase investment in the communities and encourage lot owners to build or complete their buildings reducing the area for dumping of garbage, unwanted grazing, over-growth of vegetation and general property maintenance, all contributing to positive environmental actions.

4.4. Could the project have an impact on health?

Response

Yes, the project could have an impact on health in the form of air, noise and water pollution. These impacts are predicted to be minimal, localized and short term, occurring during the construction phase. After construction the project impact on health is expected to be positive with improved drainage and access.

4.5. Could the project lead to future conflicts within the project's beneficiary community?

Response

No.

4.6. Could the project lead to changes in the density of land occupation?

Response

The project will lead to changes in the density of land occupation since more persons would be encouraged to build their homes as a direct result of improved roads and other infrastructural works

4.7. Could the project lead to changes in the levels of overcrowding?

Response

The project will not lead to changes in the levels of overcrowding since the area has no issues in this regard. Increased occupancy will be welcome since there is currently a low occupancy rate within some of the selected communities. However, it can address overcrowding in other areas since persons can move from current overcrowded areas to these community.

4.8. Could the project stimulate some spontaneous movement of population towards the adjoining area of the project?

Response

The objective of the project is mainly to improve the living conditions within these communities by means of improving some of the existing infrastructural works which will ultimately address the issue of low occupancy rate. As such, there will be an increase in occupancy rate within the community. No spontaneous movement of people to adjoining areas is anticipated.

4.9. Could the project cause the elimination or relocation of existing industrial or commercial activities?

Response

No, this is not expected.

4.10. Could the project influence the monthly expenses of the population?

Response

Yes, the project has the ability to influence the monthly expenses of the population, particularly transportation costs for residents in the area. Improved roads and shorter interconnection routes between communities can reduce transportation cost over a long term basis.

4.11. Could the project affect the value of the property?

Response

Yes, the project has the potential to increase the property value of the entire community beginning with the direct beneficiaries whose streets will be paved and who will have access to better community services.

4.12. Could the project generate new productive activities?

Response

Yes, the project will generate new productive activities both during the construction phase and operational phase. The construction phase will provide employment opportunities which is expected to continue during the post project as land owners would be encouraged to construct homes on their lands.

5. INSTITUTIONAL

5.1. The project will require a variation of some, statute, permit or regulation that regulates situations of environmental damage?

Response

No, no variation of any regulation will be required.

5.2. Would the lack of articulation with other programs or undertakings (public and / or private) affect the integrity of the project?

Response

This is not expected to occur since development work within the area is usually the initiative of the CHPA.

5.3. In the case of being necessary vacant land outside the polygon, it has environmental conditions suitable for housing relocations?

Response

Vacant land surrounding the housing development can also be converted for housing development in the future.

ANNEX 2: Stakeholders Engagement

Annex 2-A: Stakeholders Engagement Feedback Summary

Stakeholder Classification	Stakeholder Feedback Summary
Primary Stakeholders	- There are needs for street names and speed humps once the road is completed. This is to ensure that roads are used in a responsible manner to avoid accidents and other misuse of roads - The new roads will be an incentive for landowner to build and move into the community. This will help the community develop further - Will help business owners in attract more customers and motivate other individuals to set up different type of businesses within the community so that residents would not have to go to Georgetown for certain services. - While it is understood that there are some temporary negative impacts associated with the project, residents are willing to make some sacrifices to ensure that the roads are completed in soonest time possible. Residents are willing to use alternative routes to access their properties. - The new roads will help pedestrians, especially school children's access in and out of the communities, since public transportation such as buses do not work in the areas. - The new roads will result in less maintenance cost to vehicles, since it would not have to go through the terrain and muddy puddles that causes damages to the vehicle. - The new roads should also include adequate street lights and street names so that the areas can be identified adequately. - The current water supply within the project area is not treated and as such, cannot be used for some purposes such as cooking and washing. - There is a high increase of robbery in the Perseverance Community. The youths are partaking in these activities. There is a need for a police outpost. - Heavy duty vehicle and garbage trucks that traverse between the intersection Peter's Hall & Mocha is causing damages to homes and discomfort for residents - Water hydrant is needed in Pln. Perseverance - Trench has not been clean since December 2019. The bridge coming into the scheme has not been maintain at the entrance of Perseverance. There is a high vegetation of grass and the bridge is deteriorating. - Water hydrant is needed in Pln. Perseverance. - Bridges should be replaced to it original quality after the project is completed

Secondary Stakeholders	- Project areas as well as the wider community should be handed over to the NDC so that there is efficient service provided to the community - There should be adequate street lighting, road markings, pedestrian crossing, road signage, and a raised curb to aid the road use of persons with disabilities and the vulnerable population - CHPA is expected to coordinate with the main utility company so that service disruptions are planned and residents can be informed of the disruptions in advance. - Since the project areas are planned communities, the likelihood of utility poles needing relocation is low, however, CHPA is encouraged to coordinate plan with the utility company in advance of the commencement of the road construction.

Annex 2-B: Stakeholder Engagement Matrix

No.	Stakeholder Entity	Contact Person	Stakeholder Category	Relevance to Project	Priority Level
1	Herstelling/Little Diamond NDC	Puneet Jaigopaul, Chairman	Local Democratic Council	Help to improve the development of the community	NA
2	Eccles/Ramsburg NDC	Anand Kalladeen, Chairman	Local Democratic Council	Help to improve the development of the community	NA
3	Eccles/Ramsburg NDC	Ramesh Persaud Vice Chairperson	Local Democratic Council	Help to improve the development of the community	NA
4	Providence Community Group	Kevin Williamson Community Chairman	Community Group	Help to improve the development of the community	Providence Phase 2
5	Providence Community Group	Ameeka Breedy Community Leader	Community Group	Help to improve the development of the community	Providence Phase 2
6	Gaitri Seojattan	Gaitri Seojattan	Private Citizen	Resident (beneficiary of project works)	1450 Providence Phase 2
7	Tansia Jodhan	Tansia Jodhan	Private Citizen	Resident (beneficiary of project works)	1031 Providence Phase 2
8	Kellon Valentine	Kellon Valentine	Private Citizen	Resident (beneficiary of project works)	982 Providence Phase 2
9	Dexter Greene	Dexter Greene	Private Citizen	Resident (beneficiary of project works)	1047 Providence Phase 2
10	Kyle Amsterdam	Kyle Amsterdam	Private Citizen	Resident (beneficiary of project works)	1052 Providence Phase 2
11	Patrick Kellman	Patrick Kellman	Private Citizen	Resident (beneficiary of project works)	1178 Providence Phase 2
12	Michael Singh	Michael Singh	Private Citizen	Resident (beneficiary of project works)	1222 Providence Phase 2
13	Leota Langford-Clarke	Leota Langford-Clarke	Private Citizen	Resident (beneficiary of project works)	1251 Providence Phase 2
14	Bernadine Beckles	Bernadine Beckles	Private Citizen	Resident (beneficiary of project works)	1416 Providence Phase 2
15	Sharon Dowden	Sharon Dowden	Private Citizen	Resident (beneficiary of project works)	998 Providence Phase 2
16	Natasha Clarke	Natasha Clarke	Private Citizen	Resident (beneficiary of project works)	1185 Providence Phase 2
17	Chan Persaud	Chan Persaud	Private Citizen	Resident (beneficiary of project works)	1289 Providence Phase 2
18	Youlanda Higgins	Youlanda Higgins	Private Citizen	Resident (beneficiary of project works)	1247 Providence Phase 2
19	Esther Hinds	Esther Hinds	Private Citizen	Resident (beneficiary of project works)	1168 Providence Phase 2
20	Rima Ramjit	Rima Ramjit	Private Citizen	Resident (beneficiary of project works)	1154 Providence Phase 2
21	Radhika Sookhan	Radhika Sookhan		Resident (beneficiary of project works)	1323 Providence Phase 2

22	Kamla Ramdin	Kamla Ramdin		Resident (beneficiary of project works)	1321 Providence Phase 2
23	Savita Singh	Savita Singh	Private Citizen	Resident (beneficiary of project works)	1147 Providence Phase 2
24	Clarrice Dalrymple	Clarrice Dalrymple	Private Citizen	Resident (beneficiary of project works)	972 Providence Phase 2
25	Nicola Austin Henry	Nicola Austin Henry	Private Citizen	Resident (beneficiary of project works)	977 Providence Phase 2
26	Adrian Benjamin	Adrian Benjamin	Private Citizen	Resident (beneficiary of project works)	1307 Providence Phase 2
27	Ramkarran Ketwaroo	Ramkarran Ketwaroo	Private Citizen	Resident (beneficiary of project works)	1301 Providence Phase 2
28	Jaipaul Singh	Jaipaul Singh	Private Citizen	Resident (beneficiary of project works)	1241 Providence Phase 2
29	Jaigobin Williams	Jaigobin Williams	Private Citizen	Resident (beneficiary of project works)	1161 Providence Phase 2
30	Pilay Todd	Pilay Todd	Private Citizen	Resident (beneficiary of project works)	1316 Providence Phase 2
31	Larry Parasram	Larry Parasram	Private Citizen	Resident (beneficiary of project works)	1341 Providence Phase 2
32	Rhon Hopkinson	Rhon Hopkinson	Private Citizen	Resident (beneficiary of project works)	1223 Providence Phase 2
33	Nicholas Richards	Nicholas Richards	Private Citizen	Resident (beneficiary of project works)	1282 Providence Phase 2
34	Keith Beaton	Keith Beaton	Private Citizen	Resident (beneficiary of project works)	1406 Providence Phase 2
35	Sabrina Holmes	Sabina Holmes	Private Citizen	Resident (beneficiary of project works)	1193 Providence Phase 2
36	Ameeka Breedy	Ameeka Breedy	Private Citizen	Resident (beneficiary of project works)	949 Providence Phase 2
37	Rhonda Spencer	Rhonda Spencer	Private Citizen	Resident (beneficiary of project works)	1428 Providence Phase 2
38	Milisa Karl	Milisa Karl	Private Citizen	Resident (beneficiary of project works)	954 Providence Phase 2
39	Frolette Ward	Frolette Ward	Private Citizen	Resident (beneficiary of project works)	976 Providence Phase 2
40	Wendy Johnson	Wendy Johnson	Private Citizen	Resident (beneficiary of project works)	1029 Providence Phase 2
41	Tandika Griffith	Tandika Griffth	Private Citizen	Resident (beneficiary of project works)	1211 Providence Phase 2
42	Craig Colleen	Craig Colleen	Private Citizen	Resident (beneficiary of project works)	957 Providence Phase 2
43	Pheona Joseph	Pheona Joseph	Private Citizen	Resident (beneficiary of project works)	1419 Providence Phase 2
44	Wenona Aurthur	Wenona Aurthur	Private Citizen	Resident (beneficiary of project works)	1300 Providence Phase 2
45	Onika Demoic	Onika Demoic	Private Citizen	Resident (beneficiary of project works)	1304 Providence Phase 2
46	Trevon Raphael	Trevon Raphael	Private Citizen	Resident (beneficiary of project works)	1464 Providence Phase 2
47	Shree Shiva Shakti Devi Seva Mandir	Shree Shiva Shakti Devi Seva Mandir	Private Citizen	Resident (beneficiary of project works)	1301 Providence Phase 2

48	Delvin Austin	Delvin Austin	Private Citizen	Resident (beneficiary of project works)	551 Pln. Peter's Hall
49	Natasha Samaroo	Natasha Samaroo	Private Citizen	Resident (beneficiary of project works)	650 Pln. Peter's Hall
50	Jane Ann Alfred	Jane Ann Alfred	Private Citizen	Resident (beneficiary of project works)	214 Pln. Peter's Hall
51	Roger Smith	Roger Smith	Private Citizen	Resident (beneficiary of project works)	566 Pln. Peter's Hall
52	Kwizzy Chung	Kwizzy Chung	Private Citizen	Resident (beneficiary of project works)	568 Pln. Peter's Hall
53	Shondell Payne-Forde	Shondell Payne-Forde	Private Citizen	Resident (beneficiary of project works)	573 Pln. Peter's Hall
54	Sunita Shew	Sunita Shew	Private Citizen	Resident (beneficiary of project works)	659 Pln. Peter's Hall
55	Diana Black	Diana Black	Private Citizen	Resident (beneficiary of project works)	239/653 Pln. Peter's Hall
56	Luke Lorris	Luke Lorris	Private Citizen	Resident (beneficiary of project works)	209 Pln. Peter's Hall
57	Nandrine Thom	Nandrine Thom	Private Citizen	Resident (beneficiary of project works)	571 Pln. Peter's Hall
58	Jone Byrne	Jone Bryne	Private Citizen	Resident (beneficiary of project works)	126 Pln. Peter's Hall
59	Bibi Hamab	Bibi Hamab	Private Citizen	Resident (beneficiary of project works)	Pln. Peter's Hall
60	Richard Griffith	Richard Griffith	Private Citizen	Resident (beneficiary of project works)	211 Pln. Peter's Hall
61	Michael Fredericks	Michael Fredericks	Private Citizen	Resident (beneficiary of project works)	Pln. Peter's Hall
62	John Hernandez	John Hernandez	Private Citizen	Resident (beneficiary of project works)	Pln. Peter's Hall
63	Peters Hall Community Group	John Hernandez	Community-Based Organization	Help to improve the development of the community	631/217 Pln. Peter's Hall
64	Peters Hall Community Group	Zameer &Keenan Mohammed	Community-Based Organization	Help to improve the development of the community	599/185 Pln. Peter's Hall
65	Ayesha Primo	Ayesha Primo	Private Citizen	Resident (beneficiary of project works)	Pln. Peter's Hall
66	Juanita Waterman	Juanita Waterman	Private Citizen	Resident (beneficiary of project works)	Pln. Peter's Hall
67	Mohanie Persaud	Mohanie Persaud	Private Citizen	Resident (beneficiary of project works)	Pln. Peter's Hall
68	Simone Block-Hafeez	Simone Hafeez	Private Citizen	Resident (beneficiary of project works)	Pln. Providence Ph.2. (North and South)
69	Alvin Yearwood	Alvin Yearwood	Private Citizen	Resident (beneficiary of project works)	Pln. Providence ph.2. (North and South)
70	Naomi Block	Naomi Block	Private Citizen	Resident (beneficiary of project works)	Pln. Providence Ph.2. (North and South)
71	Tavendra Ojha	Tavendra Ojha	Private Citizen	Resident (beneficiary of project works)	1312 Pln. Providence Ph.2.
72	Alicia Samaroo	Alicia Samaroo	Chairperson for Perseverance	Resident (beneficiary of project works)	469 Pln. Perseverance

			Community Group and Management Committee		
73	June Matthews	June Matthews	Community Group	Resident (beneficiary of project works)	Pln. Perseverance
74	Esther Fernandes	Esther Fernandes	Community Group	Resident (beneficiary of project works)	615 Pln. Perseverance
75	Carol Dash	Carol Dash	Community Group	Resident (beneficiary of project works)	53 Pln. Perseverance
76	Valerie De Freitas	Valerie De Freitas	Private Citizen	Resident (beneficiary of project works)	Pln. Perseverance
77	Tracy Fanfair	Tracy Fanfair	Private Citizen	Resident (beneficiary of project works)	Pln. Covent Garden
78	Shonette Tross	Shonette Tross	Private Citizen	Resident (beneficiary of project works)	Pln. Covent Garden
79	Barbara Emanuel	Barbara Emanuel	Private Citizen	Resident (beneficiary of project works)	1469 Pln. Covent Garden
80	Omar Caravaio	Omar Caravaio	Private Citizen	Resident (beneficiary of project works)	1166 Pln. Covent Garden
81	Leon King	Leon King	Private Citizen	Resident (beneficiary of project works)	1471 Pln. Covent Garden
82	Kenneth Quintyn	Kenneth Quintyn	Private Citizen	Resident (beneficiary of project works)	1288 Pln. Covent Garden
83	Joseph Bridgewater	Joseph Bridgewater	Private Citizen	Resident (beneficiary of project works)	1267 Pln. Covent Garden
84	Dionne Cameron-Joseph	Dionne Cameron Joseph	Private Citizen	Resident (beneficiary of project works)	1188 Pln. Covent Garden
85	Jankie Omesh	Jankie Omesh	Private Citizen	Resident (beneficiary of project works)	1158 Pln. Covent Garden
86	Doodnauth Yogashur	Doonauth Yogashur	Private Citizen	Resident (beneficiary of project works)	1202 Pln. Covent Garden
87	Peter John	Peter John	Private Citizen	Resident (beneficiary of project works)	1312 Pln. Covent Garden
88	Rolanda Campbell	Rolanda Campbell	Private Citizen	Resident (beneficiary of project works)	1149 Pln. Covent Garden
89	Aleshaw Richmond	Aleshaw Richmond	Private Citizen	Resident (beneficiary of project works)	1470 Pln. Covent Garden
90	Vijailakshmi Raghoober	Vijailakshmi Raghober	Private Citizen	Resident (beneficiary of project works)	1477 Pln. Covent Garden
91	Glenda Mattheson-Campbell	Glenda Matheson-Campbel	Private Citizen	Resident (beneficiary of project works)	1199 Pln. Covent Garden
92	Dianne Tappin	Dianne Tappin	Private Citizen	Resident (beneficiary of project works)	Pln. Covent Garden
93	Oneika Layne	Oneika Layne	Private Citizen	Resident (beneficiary of project works)	1186 Pln. Covent Garden
94	Ottilie Nurse	Ottilie Nurse	Private Citizen	Resident (beneficiary of project works)	1206 Pln. Covent Garden
95	Isha Porte	Isha Porte	Private Citizen	Resident (beneficiary of project works)	1173 Pln. Covent Garden
96	Vaunda Wayne-Francis	Vaunda Wayne-Francis	Private Citizen	Resident (beneficiary of project works)	1422 Pln. Covent Garden

97	Naresh Singh	Naresh Singh	Private Citizen	Resident (beneficiary of project works)	1298 Pln. Covent Garden
98	Mark Persaud	Mark Persaud	Private Citizen	Resident (beneficiary of project works)	1419 Pln. Covent Garden
99	Jason Fagundes	Jason Fagundes	Private Citizen	Resident (beneficiary of project works)	1431 Pln. Covent Garden
100	Neil Thomas	Neil Thomas	Private Citizen	Resident (beneficiary of project works)	1142 Pln. Covent Garden
101	Raoul Forte	Raoul Forte	Private Citizen	Resident (beneficiary of project works)	Pln. Farm Ph.2
102	V. Gomes	V. Gomes	Private Citizen	Resident (beneficiary of project works)	Pln. Farm ph..2
103	Dennis Griffith	Dennis Griffith	Private Citizen	Resident (beneficiary of project works)	998 Pln. Farm Ph.2
104	Andre Bouyea	Andre Bouyea	Private Citizen	Resident (beneficiary of project works)	1184 Pln. Farm Ph.2
105	Melissa Persaud	Melissa Persaud	Private Citizen	Resident (beneficiary of project works)	Pln. Farm Ph.2
106	Franchine Brown	Franchine Brown	Private Citizen	Resident (beneficiary of project works)	2111 Pln. Farm Ph.2
107	Shonette Pearson	Shonette Pearson	Private Citizen	Resident (beneficiary of project works)	1161 Pln. Farm Ph.2
108	Michelle Moore	Michelle Moore	Private Citizen	Resident (beneficiary of project works)	1654 Pln. Farm Ph.2
109	Melissa Persaud	Melissa Persaud	Private Citizen	Resident (beneficiary of project works)	1779 Pln. Farm Ph.2
110	Noreen Vanvield	Noreen Vanvield	Private Citizen	Resident (beneficiary of project works)	2109 Pln. Farm Ph.2
111	Radika Ramsaroop	Radika Ramsaroop	Private Citizen	Resident (beneficiary of project works)	2175 Pln. Farm Ph.2
112	Karen Haywood	Karen Haywood	Private Citizen	Resident (beneficiary of project works)	987 Pln. Farm Ph.2
113	Valerie Jphnson	Valerie johnson	Private Citizen	Resident (beneficiary of project works)	1150 Pln. Farm Ph.2
114	Marlon Melville	Marlon Melville	Private Citizen	Resident (beneficiary of project works)	1172 Pln. Farm Ph.2
115	Dwayne Loncke	Dwayne Loncke	Private Citizen	Resident (beneficiary of project works)	2107 Pln. Farm Ph.2
116	Jahmaal Williams	Jahmaal Williams	Private Citizen	Resident (beneficiary of project works)	966 Pln. Farm Ph.2
117	Dinesh Kumar	Dinesh Kumar	Private Citizen	Resident (beneficiary of project works)	1005 Pln. Farm Ph.2
118	Indal Singh	Indal Singh	Private Citizen	Resident (beneficiary of project works)	1742 Pln. Farm Ph.2
119	Wesley Vanlewin	Wesley Vanlewin	Private Citizen	Resident (beneficiary of project works)	1665 Pln. Farm Ph.2
120	David Persaud	David Persaud	Private Citizen	Resident (beneficiary of project works)	1819 Pln. Farm Ph.2
121	Indarmattie Ramdayal	Indarmattie Ramdayal	Private Citizen	Resident (beneficiary of project works)	1744 Pln. Farm Ph.2
122	Rochell Ferreira	Rochell Ferreira	Private Citizen	Resident (beneficiary of project works)	1818 Pln. Farm Ph.2
123	Savitri Gomes	Savitri Gomes	Private Citizen	Resident (beneficiary of project works)	1740 Pln. Farm Ph.2

124	Savitrie Dhanraj	Savitrie Dhanraj	Private Citizen	Resident (beneficiary of project works)	2215 Herstelling Plot C
125	Bharrat Dhanraj	Bharrat Dhanraj	Private Citizen	Resident (beneficiary of project works)	2215 Herstelling Plot C
126	Aftab Persaud	Aftab Persaud	Private Citizen	Resident (beneficiary of project works)	Herstelling Plot C
127	Pamela Yong	Ronela Yong	Private Citizen	Resident (beneficiary of project works)	2196 Herstelling Plot C
128	Theresa Kissoon	Theresa Kissoon	Private Citizen	Resident (beneficiary of project works)	2196 Herstelling Plot C
129	Myra Bollers	Myra Bollers	Private Citizen	Resident (beneficiary of project works)	2223 Herstelling Plot C
130	Liseanne Jones-Douglas	Liseanne Jones-Douglas	Private Citizen	Resident (beneficiary of project works)	Herstelling Plot C
131	Gordon Douglas	Gordon Douglas	Private Citizen	Resident (beneficiary of project works)	Herstelling Plot C
132	Alistair Carr	Alistair Carr	Private Citizen	Resident (beneficiary of project works)	2201 Herstelling Plot C
133	Maheshwar Saywack	Maheshwar Saywack	Private Citizen	Resident (beneficiary of project works)	2192 Herstelling Plot C
134	Daramdai Saywack	Daramdai Saywack	Private Citizen	Resident (beneficiary of project works)	Herstelling Plot C
135	Dharamraj Saywack	Dharamraj Saywack	Private Citizen	Resident (beneficiary of project works)	Herstelling Plot C
136	Rhonda Lyght	Rhonda Lyght	Private Citizen	Resident (beneficiary of project works)	2152 Herstelling Plot C
137	Malika Scott	Malika Scott	Private Citizen	Resident (beneficiary of project works)	2135 Herstelling Plot C
138	Nikita Caines	Nikita Caines	Private Citizen	Resident (beneficiary of project works)	2199 Herstelling Plot C
139	B. W Khan	B. W Khan	Private Citizen	Resident (beneficiary of project works)	2216 Herstelling Plot C
140	Sursattie Singh	Sursattie Singh	Private Citizen	Resident (beneficiary of project works	2192 Herstelling Plot C
141	R.Nandkishore	R.Nandkishore	Private Citizen	Resident (beneficiary of project works)	2149 Herstelling Plot C
142	Jonathan Persaud	Jonathan Persaud	Private Citizen	Resident (beneficiary of project works)	2145 Herstelling Plot C
143	Diana Persaud	Diana Persaud	Private Citizen	Resident (beneficiary of project works)	2145 Herstelling Plot C
144	Rakesh Ramnarine	Rakesh Ramnarine	Private Citizen	Resident (beneficiary of project works)	2216 Herstelling Plot C
145	Leseen Lewis	Leseen Lewis	Private Citizen	Resident (beneficiary of project works)	2194 Herstelling Plot C
146	Bharrat Khemraj	Bharrat Khemraj	Private Citizen	Resident (beneficiary of project works)	2215 Herstelling Plot C
147	Colleen Nestor	Colleen Nestor	Private Citizen	Resident (beneficiary of project works)	2139 Herstelling Plot C
148	Sawainte Khan	Sawainte Khan	Private Citizen	Resident (beneficiary of project works)	2153 Herstelling Plot C
149	Vishnu Ramah	Vishnu Ramah	Private Citizen	Resident (beneficiary of project works)	2153 Herstelling Plot C

150	Radica Charran	Radica Charran	Private Citizen	Resident (beneficiary of project works)	2149 Herstelling Plot C
151	Narajan Saywack	Narajan Saywack	Private Citizen	Resident (beneficiary of project works)	2192 Herstelling Plot C
152	Mukesh Narine	Mukesh Narine	Private Citizen	Resident (beneficiary of project works)	2178 Herstelling Plot C
153	Ronella Peters	Ronella Peters	Private Citizen	Resident (beneficiary of project works)	2135 Herstelling Plot C
154	Nicholas Fraser	Nicholas Fraser	Private Citizen	Resident (beneficiary of project works)	2135 Herstelling Plot C
155	Fiona Fraser	Fiona Fraser	Private Citizen	Resident (beneficiary of project works)	2135 Herstelling Plot C

Annex 2-C: Stakeholders Project Information Booklet

BACKGROUND

The Ministry of Housing and Water (MOH&W) Central Housing and Planning Authority (CH&PA), is implementing the Adequate Housing and Urban Accessibility Program (AHUAP) with financing through a loan from the Inter-American Development Bank (IDB). The duration of the project spans December, 2017 to June, 2024. The programme encompasses three components:

Sub-component 1.1: Affordable and sustainable housing. ($US 10 million). This includes a Home Improvement Subsidy and Core Home Support Programme, which targets low-income households including single parent households and involves the construction of 250 core homes and the disbursement of 2000 home improvement subsidies.

Sub-component 1.2: Consolidation of existing housing schemes. ($US 16 million). This includes the rehabilitation of infrastructure such as climate ready drainage, street lighting, community facilities road(s)upgrades), sidewalks etc.

Sub-component 1.3: Implementation of institutional strengthening. ($US 1 million). This component provides training and capacity building for CH&PA and Local Democratic Organs etc.

In recognition of the above, six (6) Housing Schemes namely: Herstelling Plot C, Peter's Hall Phase 1, Providence Phase 2 (North & South), Perseverance, Farm Phases 1 & 2 and Covent Garden along the corridor of the East Bank Demerara were identified as the third project site where infrastructure upgrade interventions will be conducted under the AHUAP.

HOW TO MAKE A COMPLAINT

Complaints can be made via the following mediums:

- Filling out and submitting a complaint form. The grievance/complaint forms will be made available at all of the site offices where rehabilitative works will be conducted within your area. These forms can be submitted to the Clerk of Works who will be present at the various site offices.
- Verbal complaint or inquiry can be made to the Environmental and Social Safeguard Technical Officer or to the onsite Supervisory team in your area.
- The Project Affected Person (PAP) can also visit the CH&PA, Community Development Department, sub office located at Lot 237 Camp Street to lodge a verbal or written complaint. A grievance/complaint suggestion box and the availability of complaint forms will be accessible to the public. The grievance/ complaints will be monitored on a daily basis.
- Inquiry can also be made with the Community Development Officers, at the CH&PA Sub-office.
- Grievances can also be communicated via telephone or email as follows:

Telephone, E-Mail and Social Media platform options for recording grievances.

Project Hotline

- The hotline will be answered **(by the Community Engagement Unit)** during regular business hours **(8:00am to 4:30pm Monday-Thursday and 8:00am to 3:30pm on Fridays) 223-1027-28**
- Email address **(cddannex@chpa.gov.gy)**
- Facebook page **Central Housing and Planning Authority**

Should you require any additional information or clarification, please feel free to contact the following persons from the Community Development Department: **Ms. Carnesehia Pereira, Community Development Officer II** or **Ms. Shennel Moore, Community Development Officer III** on telephone number **223-1027 Extension 210 or 211** respectively.

Upcoming Project activities for the East Bank Demerara communities under Adequate Housing Urban Accessibility Programme Component 1.2

- Women Safety Audit (WSA)
- Environmental and Social Assessment (ESA) public disclosure meetings
- Roll-out of upgrade works
- Continuous Stakeholder Engagement Exercises throughout the duration of the Project lifecycle.

N.B: The dates for the activities, once finalized, will be communicated subsequently.

ENVIRONMENT SOCIAL SAFEGUARD MANAGEMENT

Project Execution Phase:

• Active Health, Safety and Environmental (HSE) Monitoring and Evaluation of performance will be undertaken by CH&PA for each contractor per project. Contractor's HSE Compliance (performance) will be measured against nine (9) Environmental Social Management Plans (ESMPs), which comprise the project's approved ESMP within each Contract:

- Traffic Management Plan
- Access Management Plan
- Waste Management Plan
- Hazardous Materials Mgmt. Plan
- Soil and Drainage Mgmt. Guidelines
- Emergency Preparedness and Response Plan
- Spill Prevention, Control and Counter-measures Plan
- HSE Monitoring Plan
- Building Constructure HSE Management Plan (only applicable to Building Projects)

Compliance with the above plans will be measured on a tri-weekly basis using a pre-determined HSE inspection checklist comprising 46 HSE-related compliance indicators under the following thematic areas: General Management & Security, First-Aid & Emergency Preparedness, PPEs, Fire Fighting & Spill Response Equipment, Waste Management, Hazardous Material Storage & Use, Traffic & Access, Erosion Prevention (including Water Quality), Noise Control, Air Quality & Working from Heights.

LIVELIHOOD RESTORATION PLAN (LRP):
The LRP addresses all the displacement related impacts associated with project works within the communities and further defines the methodology for entitlements' calculation/determination and disbursement to all those persons whose assets and or income/business will be affected by this project.

GRIEVANCE REDRESS MECHANISM:
Under the (AHUAP)-Livelihood Restoration Plan (LRvP), the Grievance Redress Mechanism (GRM) seeks to receive, compile, register and, impartially, resolve complaints to address grievances, complaints, concerns or questions raised by stakeholders.

WHAT IS A GRIEVANCE?

A grievance is a complaint that someone has about the activities of the program that might stem from:

- A specific incident - Such as a road accident, property damage or night time noise
- The behaviour of workers - such as workers disrespectful or discriminatory actions
- An environmental impact - such as soil contamination, damage to agriculture
- A social impact - such as loss of recreational areas
- Other types of impacts - such as traffic, health, and cultural heritage impacts, to name a few

SUB-COMPONENT 1.1: AFFORDABLE AND SUSTAINABLE HOUSING

Status of Affordable and Sustainable Housing (ASH) component for East Bank Demerara (EBD):

Application period for this sub-component spanned November 1st , 2018 to February 1st, 2019 and November 5th 2021 to Feb 25th 2022. A total of 509 applications were received from the East Bank Demerara (EBD) for Home Improvement Subsidy. To date 105 beneficiaries have been approved for Home Improvement subsidies on the EBD.

For Core Home Support a total of 347 applications were received from the EBD. To date 11 beneficiaries have been approved for Core Home Support on the EBD.

Sub-component: 1.1.1
Home Improvement Subsidy

Under this sub-component a government grant will be given to beneficiaries only once. The grant will be in the form of building materials. The subsidy shall be determined by the necessity of every applicant and shall not exceed the value of GY$500,000 and beneficiaries are required to provide all labour.

- Applicant must satisfy the following basic criteria:

- The applicant must be a citizen of Guyana residing within the project boundary.
- The applicant must be an adult.
- The applicant must be the owner of the property (agreement of sale, transport or certificate of title).
- The applicant must complete payment for the cost of the house lot.
- The applicant must be living in the house for which he or she is requesting the subsidy.
- Households that benefited from one Home Improvement Subsidy under pervious IDB-financed operations (LISP), may be eligible to participate in this programme. However, households that may been benefited from two or more subsidies previously or under the Core Home polit are NOT eligible to participate in this Home Improvement programme.

- ***Plot of Land***
• Selected plots must be free from any legal encumbrances or ownership limitations, except in the case of legally established family-owned property.

- **Types of Eligible Improvements**
• Repairs to roofs, walls, floors (including completion of wet areas), etc.
• Improvement of earthen or wooden floors
• Replacement of walls with more durable materials such as bricks or higher quality wooden materials.
• Home extension to address over-crowding.
• Electrical works, plumbing and sanitation improvements (e.g., replacement of a pit latrine with an indoor water closet or a septic tank).

Eligibility Criteria for Home Improvement Subsidy

01 The income of the applicant shall not exceed G$75,000

02 The cost of the house lot shall not exceed G$300,000

03 The improvement requested must be eligible based on the list of approved improvement mentioned above.

04 The applicant must provide all labour required to complete the improvement

Figure 1: Photo of building before Home Improvement Subsidy

Figure 2: Photo of building after Home Improvement Subsidy

Lot 6 – Farm Phase 1&2

Scope of Works:
1. Upgrading of **2.6 km** of Asphalt roads
2. Construction of **538 m** of RC Drains and Sidewalk
3. Road Maintenance of **1.2 km**
4. Construction of **3No.** 600mm HDPE Culvert

Roads to be Upgraded
Existing Asphalt Roads

Figure 6: Lot 6 - Scope of work for Fram Phaze 1 & 2

Lot 7 – Covent Garden

Scope of Works:
1. Upgrading of **2.46 km** of Asphalt roads
2. Construction of **293 m** of RC Drains and Sidewalk
3. Construction of **1 No.** 600mm HDPE Culvert

Roads to be Upgraded
Existing Asphalt Roads

Figure 7: Lot 7 - Scope of work for Covent Garden

Lot 4 – Perseverance

Scope of Works:
1. Upgrading of **88 m** of Asphalt roads
2. Construction of **74m** of RC Drains and Sidewalk

Roads to be Upgraded
Existing Asphalt Roads

Figure 4: Lot 4- Scope of work for Perseverance

Lot 5 – Herstelling

Scope of Works:
1. Upgrading of **0.89 km** of Asphalt roads
2. Construction of **230m** of RC Drains and Sidewalk

Roads to be Upgraded
Existing Asphalt Roads

Figure 5: Lot 5- Scope of work for Herstelling

SUB-COMPONENT: 1.1.2 CORE HOME SUPPORT

The Core Home is a concrete building measuring no less than 400 sq. Ft. with zinc roof and concrete floor, 2 bedrooms, a toilet and bath, septic tank, electrical wiring and plumbing. These homes will be built on the applicant's urbanized lot allocated by CH&PA, and is designed to meet basic standards under which a household can immediately move in, and affordably expand over time. The cost of the home is **US$20,000** each, excluding lot cost. **However, selected beneficiaries are only required to pay GY$100,000.**

Eligibility Criteria for Core Home Support

- ***Applicant***
- The applicant must be a citizen of Guyana and resides withing the project boundary.
- The applicant must be an adult.
- The applicant must be the owner of the property allocated by CH&PA, holding either an Agreement of Sale, Transport or a Certificate of Title to Land.
- Must demonstrate that he/she is living in a building whose structural deficit requires replacement or is overcrowded.
- Applicant must have completed full payment for the cost the house lot.
- The cost of the lot shall not exceed **GY$300, 000**

N.B: Households that benefited from two or more subsidies or from the Core House Pilot under previous IDB-financed operations, are NOT eligible to participate in this programme.

CORE

Figure 3: Exterior Photo of Core Home Support

Figure 4: Interior Photo of Core Home Support

HOME

Figure 5: Exterior Photo of Core Home Support

SUB-COMPONENT 1.2: CONSOLIDATION OF EXISTING HOUSING SCHEMES

Consolidation of existing housing schemes includes the rehabilitation of infrastructure such as climate ready drainage, street lighting, community facilities roads (upgrades), sidewalks etc.

Table 1 and Figures 2 to 7 shows the works that are intended to be done for listed areas

Lots	Locations	Upgrading of Roads	Construction of RC Drain and Sidewalk	Construction of 600mm Sidewalk
1	Peters Hall	0.8 km	162m	-
2	Providence Phase 2 North	1.3km	532m	1 No.
3	Providence Phase 2 South	0.3km	214m	1 No.
4	Perseverance	0.08km	96m	-
5	Herstelling	0.8okm	230m	-
6	Farm Phase 1 and 2	2.6km	538m	3 No.
7	Covent Garden	2.46km	292m	1 No.
	Total	8.43km	2043 (2km)	6 No.

Table 1: Overall, Scope of Work for East Bank Demerara communities under Adequate Housing & Urban Accessibility Programme

Figure 1: Lot 1 - Scope of work for Peters Hall

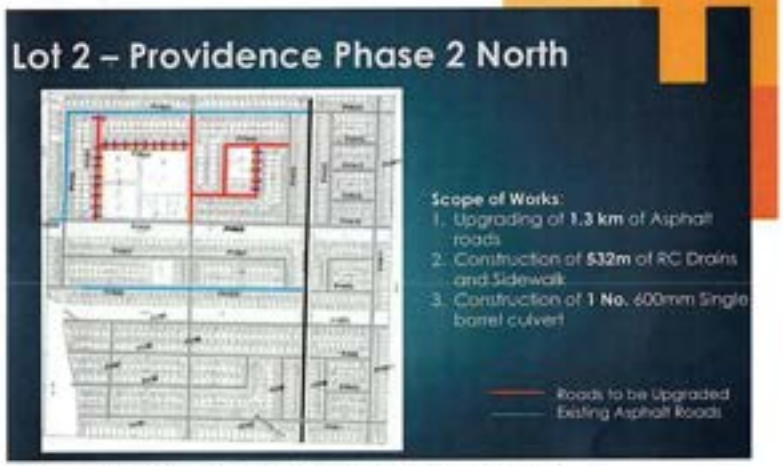


Figure 2: Figure 3: Lot 2 - Scope of work for Providence Phase 2 North

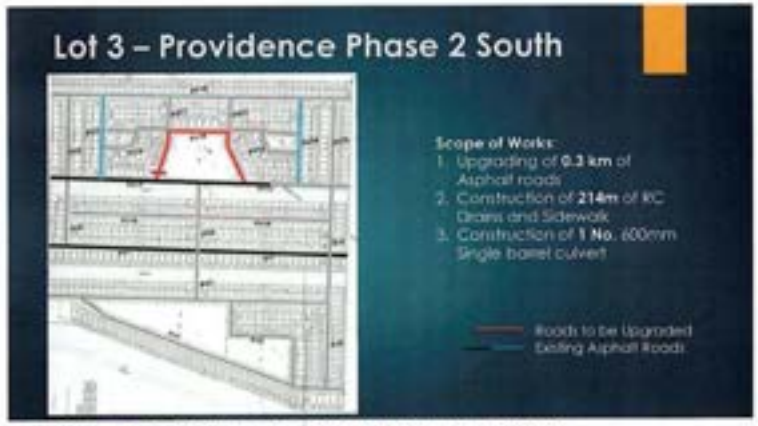


Figure 3: Figure 3: Lot 2 - Scope of work for Providence Phase 2 North

Annex 2-D (i): Stakeholders Interview Sheet – Organised Group

Ministry of Housing and Water
Central Housing and Planning Authority
Adequate Housing Urban Accessibility Programme
Community Consultation Response Sheet

Organized Groups

The Government of Guyana (GoG), through a $US 28 million loan from the Inter-American Development Bank (IDB), is implementing the Adequate Housing and Urban Accessibility Program (AHUAP) through the Ministry of Housing and Water (MoHW) Central Housing and Planning Authority (CH&PA).

As a part of the Stakeholder Engagement Process, the agency consults with residents and/or organized groups in the housing areas where the project is being implemented. Your community has been selected to benefit from infrastructure upgrade works under the project. As such, the CH&PA would like to ensure that you are informed about the project and give you the opportunity to share your ideas, concerns and recommendations. An information booklet was prepared with information about the project. This is submitted for your perusal. Further, we have included this community consultation response sheet to obtain your feedback.

The response sheet will be retrieved within one (1) week after the initial distribution of the information booklet.

We would be grateful if, after you have read the information booklet, you would fill out the response sheet. Please feel free to share your concerns, questions, comments and recommendations regarding the project. We require your name and contact information, since the Community Development Department (CDD) may need to consult with you to clarify information or to update you on upcoming activities. However, if you do not wish to state your name, that will be respected. This information you provide will be analyzed and communicated to decision makers and can influence the project outcome.

Section A

1. Name of Organization: _____
2. Type of Organization: Faith Based Organization ☐ Non-Governmental Organization ☐
   Sports Organization ☐ Community Groups ☐
   Others (Please State): _____
3. Address: _____
4. Contact No. _____
5. Email: _____
6. Please indicate the best means for the department to communicate with you.
   a) Mobile Phone (SMS) ☐ b) Mobile Phone (WhatsApp) ☐ c) Email ☐
   d) Other: Please state: _____

Please indicate if there be any questions or comments concerning the Information Package in Section B below.

Section B

1. Did you receive the Adequate Housing Urban Accessibility Programme (AHUAP) Information Package?

   a) Yes ☐ b) No ☐

2. Do you have questions about any of the Components?

   a) Yes ☐ b) No ☐

2.1 If yes, please record your questions below.

a) Component 1.1: Affordable and Sustainable Housing

_____

_____

b) Component 1.2: Consolidation of existing housing schemes

_____

_____

c) Component 1.3: Implementation support and institutional strengthening

_____

_____

3. Do you have any comments or concerns about any of the Components?

   a) Yes ☐ b) No ☐

3.1 If yes, please record your comments or concerns below.

a) Component 1.1

_____

_____

b) **Component 1.2**

_____

_____

c) **Component 1.3**

_____

_____

4. Do you have any Recommendations?

Yes ☐ b) No ☐

4.1 If yes, please record your recommendations below.

a) **Component 1.1**

_____

_____

b) **Component 1.2**

_____

_____

c) **Component 1.3**

_____

_____

5. Are there any other matters that you would like to bring to the attention of Central Housing and Planning Authority (CHPA) for your community?

_____

_____

_____

_____

Annex 2-D (ii): Stakeholders Interview Sheet Resident

Ministry of Housing and Water
Central Housing and Planning Authority
Adequate Housing Urban Accessibility Programme
Community Consultation Response Sheet

Residents

The Government of Guyana (GoG), through a $US 28 million loan from the Inter-American Development Bank (IDB), is implementing the Adequate Housing and Urban Accessibility Program (AHUAP) through the Ministry of Housing and Water (MoHW) Central Housing and Planning Authority (CH&PA).

As a part of the Stakeholder Engagement Process, the agency consults with residents and/ or organized groups in the housing areas where the project is being implemented. Your community has been selected to benefit from infrastructure upgrade works under the project. As such, the CH&PA would like to ensure that you are informed about the project and give you the opportunity to share your ideas, concerns and recommendations. An information booklet was prepared with information about the project. This is submitted for your perusal. Further, we have included this community consultation response sheet to obtain your feedback.

The response sheet will be retrieved within one (1) week after the initial distribution of the information booklet.

We would be grateful if, after you have read the information booklet, you would fill out the response sheet. Please feel free to share your concerns, questions, comments and recommendations regarding the project. We require your name and contact information, since the Community Development Department (CDD) may need to consult with you to clarify information or to update you on upcoming activities. However, if you do not wish to state your name, that will be respected. This information you provide will be analysed and communicated to decision makers and can influence the project outcome.

Section A

1. Last Name:_____ First Name: _____ Other Name: _____
2. Sex: Male ☐ Female ☐
3. Address: _____
4. Contact No. _____
5. Email: _____
6. Please indicate the best means for the department to communicate with you.

   a) Mobile Phone (SMS) ☐ b) Mobile Phone (WhatsApp) ☐ c) Email ☐

   d) Other: Please state: _____

Please indicate if there be any questions or comments concerning the Information Package in Section B below.

Section B

1. Did you receive the Adequate Housing Urban Accessibility Programme (AHUAP) Information Package?

   a) Yes ☐ b) No ☐

2. Do you have questions about any of the Components?

   a) Yes ☐ b) No ☐

   2.1 If yes, please record your questions below.

   a) Component 1.1: Affordable and Sustainable Housing

   _____

   _____

   b) Component 1.2: Consolidation of existing housing schemes

   _____

   _____

   c) Component 1.3: Implementation support and institutional strengthening

   _____

   _____

3. Do you have any comments or concerns about any of the Components?

   a) Yes ☐ b) No ☐

   3.1 If yes, please record your comments or concerns below.

   a) Component 1.1

   _____

   _____

b) Component 1.2

_____

_____

c) Component 1.3

_____

_____

4. Do you have any Recommendations?

Yes ☐ b) No ☐

4.1 If yes, please record your recommendations below.

a) Component 1.1

_____

_____

b) Component 1.2

_____

_____

c) Component 1.3

_____

_____

5. Are there any other matters that you would like to bring to the attention of Central Housing and Planning Authority (CHPA) for your community?

_____

Annex 2-E: Public Consultation Summary

ADEQUATE HOUSING AND URBAN ACCESSIBILITY PROGRAMME
REFORMULATION OF THE ROAD NETWORK REHABILITATION AND UPGRADE PROGRAMME
COMMUNITY WIDE PUBLIC CONSULTATION
Pln. Peter's Hall Phase.1, Pln. Providence Ph.2 (North and South) and Pln. Perseverance

Mrs. Donell Bess-Bascom, Deputy Director, Community Development, CH&PA delivering the welcome and opening remarks to residents at the public consultation

Mr. Anthony Ragnauth, Senior Engineer, CHPA&A addressing residents at the public consultation

Female resident making contribution at the public consultation

Venue: Peter's Hall Primary School Auditorium **Date: 19th November 2022** **Time: 9:00 to 11:00 am**

In accordance with the Stakeholder Engagement Plan for GY-L1031, a public consultation was held with the residents, of the above-mentioned preselected communities in relation to infrastructure works to be executed at the third project site along the East Bank Demerara corridor, under the Adequate Housing and Urban Accessibility Programme. The programme is being funded by a loan from the Inter-American Development Bank (IDB) to the Government of Guyana and will be executed under the Ministry of Housing and Water through the Central Housing and Planning Authority (CHPA). The duration of the programme spans from December 2017 to June, 2024. The objective of the consultation was to provide information, answer questions, explain the potential impacts and mitigation measures of the project and obtain stakeholders input on issues and concerns to be addressed in project development, planning and implementation. The Community Development Department (CDD) facilitated the consultation, which was led by Deputy Director, Community Development, Mrs. Donell Bess-Bascom, Senior Engineer, Mr. Anthony Ragnauth, and Environment & Social Safeguard Technical Officer, Mr. Christopher Singh, Project Support Facilitator, Mr. Marlon Laing who provided support to the facilitator.

The process entailed CHPA delivering a brief powerpoint presentation explaining the status of the Core Home Support and Home Improvement Subsidy, an overview of the scope of the infrastructure upgrade component and its positive and potential negative impacts of the programme during the construction and operation phases. Additionally, information of the proposed Environmental and Social Safeguard (ESS) Management measures for the project area were also shared with the residents.

Discussions were then facilitated with residents on questions, concerns and suggestions that they may have. Cordless microphones were provided to ensure that the contributions made were audible to all. Mobilization was led by the Community Development Department. A total Eleven (11) staff of the CH&PA provided support for the consultation. Public notice flyers were strategically distributed to residents in the preselected sections of: Peter's Hall Phase 1, Providence Ph.2 (North and South) and Perseverance to sensitize persons about the consultation.

Attendance Summary

Distribution of Persons Attending Consultation by Area/Organization		*Number of Males*	*Number of Female*
Area	*No. of Persons in Attendance*		
Peter's Hall Phase.1	5	0	5
Providence Phase 2 (North and South).	2	1	1
Perseverance	5	0	5
Eccles/Ramsburg NDC	1	1	0
Total	**13**	**2**	**11**

Table below captures the core of the discussion and issues raised at the meeting.

Topic	Officers' Presentation
Reformulation of Road Network Upgrade and Rehabilitation Programme	***Mrs. Donell Bess-Bascom, Deputy Director, Community Development*** The Inter-American Development Bank (IDB) has provided a loan to the Government of Guyana for the Reformulation of the Road Network and Rehabilitation Programme. Under the Adequate Housing and Urban Accessibility, the Ministry of Housing and Water through the Central Housing and Planning Authority (CHPA) will be implementing infrastructure works in six (6) Housing Areas along the East Bank Demerara corridor. The project boundary consists of selected low-income communities on the West Bank Demerara (La Parfaite Housing Development), East Bank Demerara (up to Grove), East Coast Demerara (up to La Bonne Intention (LBI) and 19 specific communities after LBI. These six (6) preselected housings areas: Perseverance, Peter's Hall Providence phase 2 (North and South), Herstelling, Farm phases 1&2 and Covent Garden were identified as the third project site where upgrade interventions will be conducted under the AHUAP. The duration of the programme spans from December 2017 to June, 2024. The programme encompasses three important components of the project these are: **Sub-component 1.1**: **Affordable and Sustainable Housing**, which includes a Home Improvement Subsidy and Core Home Programme, which targets low-income households including single parent households and involves the construction of 250 core homes and the disbursement of 2000 home improvement subsidies. **Sub-component- 1.1: Consolidation of Existing Housing Schemes,** which includes the rehabilitation of infrastructure such as climate ready drainage, street lighting, community facilities roads(upgrades), sidewalks etc. **Sub-component 1:3: Implementation of Institutional Strengthening** which provides training and capacity building for the Local Democratic Organ within the project boundary and CH&PA The consultation held today will provide an overview on the infrastructure works to be executed in the preselected sections along the East Bank Demerara, and status updates on the Core Home Support and Home Improvement Subsidy for the East Bank Demerara.
Core Home and Home Improvement Subsidy (sub-component 1.1)	***Mr. Marlon Laing, Project Support Facilitator*** Under this component of the project, vulnerable households, including those led by single parents, persons of low affordability and these living in structures considered not to be habitable were targeted. Project Areas consists of selected low-income communities on the West Bank Demerara (La Parfaite Housing Development), East Bank Demerara (up to Grove), East Coast Demerara (up to La Bonne Intention (LBI) and 19 specific communities after LBI: ; Bladen Hall South Squatting Area, Block 7 Pln. Mon Repos (D'Jango Town) Elizabeth Hall know as Pln. Enterprise, Lusignan Block XX1 North, Lusignan Parcel 99 (Binkey Alley), Lusignan Tract 'A' (Lusignan Pasture), Struthspey South 14B, Vigilance/Bladen Hall, Vigilance 14A/14B, Area B Lusignan (Grassfield), Enmore-(Haslington Block 20), Good Hope Area

	X, Good Hope Tract A (Phase 1), Haslington Block18, Hope Area A, Mon Repos, Block 8, Non Pariel, Block 12, Non Pariel, Section B and Vigilance Area x. and Georgetown **Project Cycle-** CHPA opened the application process for three months across 2 cycles (Nov.2018-Feb 1, 2019 and Nov 5th 2021- Feb 25th, 2022 to allow households to participate. Successful applicants will be engaged throughout. CH&PA, to date has collected and processed over 3,185 and 2,333 applications for Home Improvement subsidies and Core Home Support, respectively, between the two (2) application periods November 1st 2018- February, 2022. **Performance of beneficiary selection process for the East Bank Demerara** • A total of 509 Home Improvement Subsidy and 347 Core Home applications were received. • A total of 38 of 440 Home Improvement Subsidies and 11 of 135 Core Homes Support were approved. (Construction in progress) The agency continues to process applications for the 2 sub components. Beneficiary selection activities are still in process. All applicants who have not yet received a correspondence on the outcome of their applications will receive a written correspondence before the end of the quarter 1, 2023
What the project encompasses **Next Step**	***Mr. Anthony Ragnauth -Senior Engineer*** *The project is expected to:* • Focus on upgrading 0.89 km of Asphalt roads and construction of 230m of RC drains and sidewalk in Pln. Herstelling, 2.6 Km upgrading of asphalt roads, construction of 538m of RC drains and sidewalk, 1.2km road maintenance, and the construction of 600mm HDPE culvert in Pln. Farm Phase 1&2. • Additionally, 2.46km asphalt roads, 291m of RC Drains and sidewalks along with the construction of 1No.600mm HDPE culvert will be upgraded in Covent Garden. • Completion of the Environmental and Social Assessment (ESA): - From Nov 14th to Feb 3rd 2022 • Completion of Livelihood Restoration Plan (LRP) • Completion of Bidding Process for Upgrading Works: 1) Close Invitation of Tender on December 15th 2022. • (2) Open and Evaluate Tenders • 3) Award of Contracts Roll-Out Upgrade Works in 1st Quarter of 2023 Continuous Stakeholder Engagement Exercises through the duration of the Project
Environment and Social Safeguard Management	***Mr. Christopher Singh-Environment and Social Safeguard Technical Officer*** Active HSE Monitoring and Evaluation of performance will be undertaken by the CH&PA contractor per project per lot. Contractor's HSE compliance (performance) will be measured against (9) Environmental Social Management Plans (ESMs), which comprises the following within each contract:

	• **Traffic Management Plan** • **Access Management** • **Waste Management Plan** • **Hazardous Materials Management Plan** • **Soil and Drainage Management Guidelines** • **Emergency Preparedness and Response Plan** • **Spill Prevention, Control and Countermeasure s Plan** • **HSE Monitoring Plan** • **Building Construction HSE Management (only applicable to building projects)** Compliance with the above plans will be measured on a tri-weekly basis using a pre-determined HSE inspection checklist comprising 46 No. HSE related compliance indicators under the following thematic areas: General Management & Security, First-Aid & Emergency Preparedness, PPEs, Fire Fighting & Spill Response Equipment, Waste Management, Hazardous Material Storage & Use, Traffic & Access, Erosion Prevention (including Water Quality), Noise Control, Air Quality & Working from Heights. Additionally, under the AHUAP, a Grievance Redress Mechanism (GRM) will be implemented to address complaint(s) that someone has about the activities of the program that might stem from: • A specific Incident- Such as a road accident, property damage or night-time noise • The behavior of workers- such as workers disrespectful or discriminatory actions • An environment impact- such as soil contamination, damage to agriculture • A social impact- such as loss of recreation areas • Other types of impacts- such as traffic, health, and cultural heritage impacts, to name a few. As previously executed at the first and second project sites (Sophia and La Parfaite Harmonie) grievance/suggestion box will be provided at the site offices. Complaint forms can be filled out and submitted to the site offices, CH&PA Community Development Department Camp Street sub-office grievance/suggestion box. verbal complaints or inquiry can be made to the Environmental and Social Safeguard Technical Officer or to the onsite Supervisory team in your area or on telephone number 223-1027/28 Extension 210 or 211 respectively.

Community	Community Response	CH&PA Response
Mr. Ramesh Persaud, Vice Chairman, Eccles/ Ramsburg, NDC	Since the application process has closed, is there any other way to apply?	**Mrs. Donell Bess-Bascom, Deputy Director, Community Development CH&PA:** No more applications are accepted after the closing date. Further, the application opened twice and had an extension. However, CHPA has launched a cement and stone project, which provides startup materials to support the construction of foundation and columns. Persons can benefit from that program, once they qualify.
Ms. Alicia Samaroo, Chairperson Perseverance Management Committee and Community Group	When is the project expected to commence?	**Mr. Anthony Ragnauth, Senior Engineer, CH&PA:** the project is expected to commence within the first quarter of 2023.
Ms. Esther Fernandes, Resident, 615 Pln. Perseverance- Public Relation Officer for Perseverance Community Group	I live in a wooden duplex that requires lots of repairs. Since the application process is closed can I still apply for program or how can I get help?	**Mrs. Donell Bess-Bascom, Deputy Director, Community Development, CH&PA:** No more application are accepted after the closing date. Further, the application process was opened twice and had an extension. However, CH&PA has launched a cement and stone project, which provides startup materials to support the construction of foundation and columns. Persons can benefit from this programme once they qualify. In addition, the Ministry of Human Services and Social Security provides assistance with materials for persons in need.
	There is a high increase of robbery in the Perseverance Community. The youths are partaking in these activities. There is a need for a police outpost.	**Mrs. Donell Bess-Bascom, Deputy Director, Community Development CH&PA:** This matter should be referred to the police. The Community Development Department will communicate this to the IACC.
Ms. Valerie Gomes, Resident, 682 B Pln. Perseverance	I live in a concrete duplex where the structural integrity of the building is compromised. Many reports were made to CH&PA about the issue and its deplorable conditions. To date no visit was done and the problem has not been resolved. Also, myself and neighbor need help to construct fence and drainage.	**Mrs. Donell Bess-Bascom, Deputy Director, Community Development CH&PA:** This matter will be forwarded to the Housing Administration Department. In addition, the Ministry of Human Services and Social Security provides assistance with materials for persons in need. However, none of CH&PA's programmes address fence construction and drainage construction at an individual level.

Ms. Carol Dash, Resident- 53 Pln. Perseverance	The roof of my house is damaged really bad due to bat infestation. There is a need for a speed bump at Star Apple Street in Pln. Perseverance. I have written to the Ministry of Housing in relation to permission to clean and use the reserve for the purpose of farming.	**Mrs. Donell Bess-Bascom, Deputy Director, Community Development CH&PA:** Kindly provide your lot number to us and the matter will be forwarded to the respective department. **Mr. Ramesh Persaud, Vice Chairman, Eccles/ Ramsburg, NDC:** Each housing scheme has reserve site that will be used by the interagency to build schools, police outpost etc.
Ms. Alicia Samaroo, Chairperson Perseverance Management Committee and Community Group	There is a lot of unoccupied houses that was built by CH&PA, these houses are used by criminals to stake out, rod residences and to hid stolen articles. Numerous letters were written to the CHPA to address this matter but to date has not been actioned.	**Mrs. Donell Bess-Bascom, Deputy Director, Community Development CH&PA:** a follow up will be done with the respective department to address this matter.
Mr. Tavendra Ojha, Resident, 1312 Providence. Ph.2	How soon will the reserves in Providence be occupied? Are there any regulations that govern how much feet should a house be built from its fence? Over the past ten years my neighbor to the left has not cleared their land and its very dangerous. Providence needs a school.	**Mr. Anthony Ragnauth, Senior Engineer, CH&PA:** No specific timeline was allocated for the reserves at Providence to be occupied. **Mr. Ramesh Persaud, Vice Chairman, Eccles/ Ramsburg, NDC:** Guidelines for building is govern by chapter 28:02 with regards to the set back distance to position your building from the fence as part of the building standards. It is one standard guideline across the board. **Mrs. Donell Bess-Bascom, Deputy Director, Community Development, CH&PA:** Kindly provide your lot number to us and the matter will be forwarded to the respective department. **Mrs. Donell Bess-Bascom, Deputy Director, Community Development, CH&PA:** The Ministry of Education usually build schools according to their criteria. Miles apart from each other. They have a pre-determined formula that includes consideration for population, distance from other schools etc. The CH&PA designs housing area with reserve sites. The respective Ministries would then plan the use of the reserve sites based on their criteria.

Ms. Ayesha Primo, Resident- 44 Pln. Peter's Hall	Because of the road project, the house that I am renting will be moved and I have to move very soon. However, I have a lot in Lust-En-Rust and applied for the Core Home. Can I be relocated? Is there any help for me?	**Mrs. Donell Bess-Bascom, Deputy Director, Community Development, CH&PA:** Your Core Home application has been prioritized. However, you are free to write the Minister's Secretariat if there is a desire to relocate. If relocated consideration must be made on whether the scheme is located within the project boundary in order to benefit from the Core Home Support.
Ms. Juanita Waterman, Resident- 13 Pln. Peter's Hall	The Ministry of Housing and Water should engage the Guyana Telephone and Telegraph company (GTT) and the Guyana Power and Light Inc (GPL) before building scheme.	**Mr. Anthony Ragnauth, Senior Engineer, CH&PA:** the CH&PA do engage these agencies.
	Heavy duty vehicle and garbage trucks that traverse between the intersection Peter's Hall & Mocha is causing damages to homes and discomfort for residents. There are cracks in my walls. What assistance can be offered?	**Mrs. Donell Bess-Bascom, Deputy Director, Community Development, CH&PA:** Kindly provide your lot number to us and a officer from the CDD will investigate your matter.
Ms. Alicia Samaroo, Chairperson Perseverance Management Committee and Community Group	The lights on the lantern poles are not working in the community. Utility poles are being dump in the public open spaces Requesting security hut to be handed over to the community policing group.	**Mrs. Donell Bess-Bascom, Deputy Director, Community Development, CH&PA:** This will be communicated to the decision makers at the CH&PA since, the area is still under CH&PA's purview.
Ms. June Matthew, Resident-680 Pln. Perseverance	Water hydrant is needed in Pln. Perseverance.	**Mrs. Donell Bess-Bascom, Deputy Director, Community Development CH&PA:** This matter should be referred to the Guyana Fire Service.
	Trench has not been clean since December 2019. The bridge coming into the scheme has not been maintain at the entrance of Perseverance. There is a high vegetation of grass and the bridge is deteriorating.	**Mrs. Donell Bess-Bascom, Deputy Director, Community Development, CH&PA:** This will be communicated to the decision makers at the CH&PA since, the area is still under CH&PA's purview.
Livelihood disruption and Grievance Mechanism	***Mrs. Donell Bess-Bascom, Deputy Director, Community Development.*** What the CH&PA does practice is to ensure that the residents are adequately notified through the distribution of notification of works letters. The letters would usually state the duration of the project, expected impact and mitigation measures.	

	This is the first of many engagements which will be continued throughout the project cycle. The CDO, is responsible to ensure that the grievance box is checked on a weekly basis. Once grievance forms are retrieved a follow up will be done to ensure the grievance is addressed and closed. ***Mr. Christopher Singh. Environment and Social Safeguard Technical Officer.*** • As Part of the project development process, some disruption will happen. For example, during for the construction of the roads some bridges or businesses will be disrupted. To minimize the impact of this disruption CH&PA will develop a Livelihood Restoration plan to address these issues, where they may occur • The inflow and outflow of traffic may also be disrupted during road construction. CH&PA will develop alternative routes to address these and the necessary changes will be communicated to the residents. • Information will be communicated through social media platform, flyers, and various community groups.
Community Participation **Closing Remarks**	***Mrs. Donell Bess-Bascom, Deputy Director, Community Development*** • As a requirement of the programme, a community-based project monitoring committee will be established. This committee will include at least two (2) members from the Faith-based Organizations, Local Democratic Organ, Community Groups, and Community-based Organizations etc. which will represent the six pre-selected housing areas before the project commence in the first quarter. This was done in Sophia and La Parfaite Harmonie • Throughout, the project cycles the members will be engaged through meetings on a monthly basis with the project team for updates on the progress of the project. Also, the project team will be noting the issues and concerns raised as it relates to the project. • The committee will represent the interest of a particular group that can support softer development initiatives. The committee can also be used as a medium to assist in the dissemination of information Mrs. Donell Bess-Bascom in her closing remarks thank the residents for attending this informative session. She further eluded that the CH&PA will be conducting a Women's Safety Audit (WSA), and Environment and Social Assessment (ESA) public disclosure meeting which will further update the residents on the project and the outcome of the study. Meeting adjourned 11:30am

Prepared by: Bethany Ramsaroop *(Scribe)*

Assistant Community Development Officer

ADEQUATE HOUSING AND URBAN ACCESSIBILITY PROGRAMME
REFORMULATION OF THE ROAD NETWORK REHABILITATION AND UPGRADE PROGRAMME
COMMUNITY WIDE PUBLIC CONSULTATION
Herstelling, Farm Phase 1 and 2 and Covent Garden

Female resident making contribution at the public consultation

Mr. Anthony Ragnauth, Senior Engineer, CH&PA addressing residents at the public

The section of the attendees at the public consultation

Venue: Peter's Hall Primary School Auditorium **Date: 19th November 2022** **Time: 14:00 to 16:30 pm**

In accordance with the Stakeholder Engagement Plan for GY-L1031, a public consultation was held with the residents, of the above-mentioned preselected communities in relation to infrastructure works to be executed at the third project site along the East Bank Demerara corridor, under the Adequate Housing and Urban Accessibility Programme. The programme is being funded by a loan from the Inter-American Development Bank (IDB) to the Government of Guyana and will be executed under the Ministry of Housing and Water through the Central Housing and Planning Authority (CHPA). The duration of the programme spans from December 2017 to June, 2024. The objective of the consultation was to provide information, answer questions, explain the potential impacts and mitigation measures of the project and obtain stakeholders input on issues and concerns to be addressed in project development, planning and implementation. The Community Development Department (CDD) facilitated the consultation, which was led by Deputy Director, Community Development, Mrs. Donell Bess-Bascom,

Senior Engineer, Mr. Anthony Ragnauth, and Environment & Social Safeguard Technical Officer, Mr. Christopher Singh, Project Support Facilitator, Mr. Marlon Laing who provided support to the facilitator.

The process entailed CHPA delivering a brief powerpoint presentation explaining the status of the Core Home Support and Home Improvement Subsidy, an overview of the scope of the infrastructure upgrade component and its positive and potential negative impacts of the programme during the construction and operation phases. Additionally, information of the proposed Environmental and Social Safeguard (ESS) Management measures for the project area were also shared with the residents.

Discussions were then facilitated with residents on questions, concerns and suggestions that they may have. Cordless microphones were provided to ensure that the contributions made were audible to all. Mobilization was led by the Community Development Department. A total Eleven (11) staff of the CH&PA provided support for the consultation. Public notice flyers were strategically distributed to residents in the preselected sections of: Covent Garden, Herstelling and Farm Phases 1 and 2 to sensitize persons about the consultation.

Attendance Summary

Distribution of Persons Attending Consultation by Area/ Organization		***Number of Males***	***Number of Female***
Area	***No. of Persons in Attendance***		
Covent Garden	2	0	2
Farm Phases 1 &2	2	2	0
Herstelling	0	0	0
Little Diamond/Herstelling NDC	0	0	0
	Total 4	**2**	**2**

Table below captures the core of the discussion and issues raised at the meeting.

Topic	Officer's Presentation
Reformulation of Road Network Upgrade and Rehabilitation Programme	***Mrs. Donell Bess-Bascom, Deputy Director, Community Development*** The Inter-American Development Bank (IDB) has provided a loan to the Government of Guyana for the Reformulation of the Road Network and Rehabilitation Programme. Under the Adequate Housing and Urban Accessibility, the Ministry of Housing and Water through the Central Housing and Planning Authority (CHPA) will be implementing infrastructure works in six (6) Housing Areas along the East Bank Demerara corridor. The project boundary consists of selected low-income communities on the West Bank Demerara (La Parfaite Housing Development), East Bank Demerara (up to Grove), East Coast Demerara (up to La Bonne Intention (LBI) and 19 specific communities after LBI. These six (6) preselected housings areas: Perseverance, Peter's Hall Providence phase 2 (North and South), Herstelling, Farm phases 1&2 and Covent Garden were identified as the third project site where upgrade interventions will be conducted under the AIIUAP. The duration of the programme spans from December 2017 to June, 2024. The programme encompasses three important components of the project these are: **Sub-component 1.1**: **Affordable and Sustainable Housing**, which includes a Home Improvement Subsidy and Core Home Programme, which targets low-income households including single parent households and involves the construction of 250 core homes and the disbursement of 2000 home improvement subsidies. **Sub-component- 1.1: Consolidation of Existing Housing Schemes,** which includes the rehabilitation of infrastructure such as climate ready drainage, street lighting, community facilities roads(upgrades), sidewalks etc. **Sub-component 1:3: Implementation of Institutional Strengthening** which provides training and capacity building for the Local Democratic Organ within the project boundary and CH&PA The consultation held today will provide an overview on the infrastructure works to be executed in the preselected sections along the East Bank Demerara, and status updates on the Core Home Support and Home Improvement Subsidy for the East Bank Demerara.
Core Home and Home Improvement Subsidy (sub-component 1.1)	***Mr. Marlon Laing, Project Support Facilitator*** Under this component of the project, vulnerable households, including those led by single parents, persons of low affordability and these living in structures considered not to be habitable were targeted.

	Project Areas consists of selected low-income communities on the West Bank Demerara (La Parfaite Housing Development), East Bank Demerara (up to Grove), East Coast Demerara (up to La Bonne Intention (LBI) and 19 specific communities after LBI: ; Bladen Hall South Squatting Area, Block 7 Pln. Mon Repos (D'Jango Town) Elizabeth Hall know as Pln. Enterprise, Lusignan Block XX1 North, Lusignan Parcel 99 (Binkey Alley), Lusignan Tract 'A' (Lusignan Pasture), Strathspey South 14B, Vigilance/Bladen Hall, Vigilance 14A/14B, Area B Lusignan (Grassfield), Enmore-(Haslington Block 20), Good Hope Area X, Good Hope Tract A (Phase 1), Haslington Block18, Hope Area A, Mon Repos, Block 8, Non Pariel, Block 12, Non Pariel, Section B and Vigilance Area x. and Georgetown **Project Cycle-** CHPA opened the application process for three months across 2 cycles (Nov.2018-Feb 1, 2019 and Nov 5th 2021- Feb 25th, 2022 to allow households to participate. Successful applicants will be engaged throughout. CH&PA, to date has collected and processed over 3,185 and 2,333 applications for Home Improvement subsidies and Core Home Support, respectively, between the two (2) application periods November 1st 2018- February, 2022. **Performance of beneficiary selection process for the East Bank Demerara** • A total of 509 Home Improvement Subsidy and 347 Core Home applications were received. • A total of 38 *of* 440 Home Improvement Subsidies and 11 *of* 135 Core Homes Support were approved. (Construction in progress) The agency continues to process applications for the 2 sub components. Beneficiary selection activities are still in process. All applicants who have not yet received a correspondence on the outcome of their applications will receive a written correspondence before the end of the quarter 1, 2023
What the project encompasses **Next Step**	***Mr. Anthony Ragnauth -Senior Engineer*** *The project is expected to:* • Focus on upgrading 0.89 km of Asphalt roads and construction of 230m of RC drains and sidewalk in Pln. Herstelling. 2.6 Km upgrading of asphalt roads, construction of 538m of RC drains and sidewalk, 1.2km road maintenance, and the construction of 600mm HDPE culvert in Pln. Farm Phase 1&2. • Additionally, 2.46km asphalt roads, 291m of RC Drains and sidewalks along with the construction of 1No.600mm HDPE culvert will be upgraded in Covent Garden. • Completion of the Environmental and Social Assessment (ESA): - From Nov 14th to Feb 3rd 2022 • Completion of Livelihood Restoration Plan (LRP) • Completion of Bidding Process for Upgrading Works: 1) Close Invitation of Tender on December 15th 2022. • (2) Open and Evaluate Tenders • 3) Award of Contracts Roll-Out Upgrade Works in 1st Quarter of 2023 Continuous Stakeholder Engagement Exercises through the duration of the Project

Environment and Social Safeguard Management	***Mr. Christopher Singh-Environment and Social Safeguard Technical Officer*** Active HSE Monitoring and Evaluation of performance will be undertaken by the CH&PA contractor per project per lot. Contractor's HSE compliance (performance) will be measured against (9) Environmental Social Management Plans (ESMs), which comprises the following within each contract: • **Traffic Management Plan** • **Access Management** • **Waste Management Plan** • **Hazardous Materials Management Plan** • **Soil and Drainage Management Guidelines** • **Emergency Preparedness and Response Plan** • **Spill Prevention, Control and Countermeasure s Plan** • **HSE Monitoring Plan** • **Building Construction HSE Management (only applicable to building projects)** Compliance with the above plans will be measured on a tri-weekly basis using a pre-determined HSE inspection checklist comprising 46 No. HSE related compliance indicators under the following thematic areas: General Management & Security, First-Aid & Emergency Preparedness, PPEs, Fire Fighting & Spill Response Equipment, Waste Management, Hazardous Material Storage & Use, Traffic & Access, Erosion Prevention (including Water Quality), Noise Control, Air Quality & Working from Heights. Additionally, under the AHUAP, a Grievance Redress Mechanism (GRM) will be implemented to address complaint(s) that someone has about the activities of the program that might stem from: • A specific Incident- Such as a road accident, property damage or night-time noise • The behavior of workers- such as workers disrespectful or discriminatory actions • An environment impact- such as soil contamination, damage to agriculture • A social impact- such as loss of recreation areas • Other types of impacts- such as traffic, health, and cultural heritage impacts, to name a few. As previously executed at the first and second project sites (Sophia and La Parfaite Harmonie) grievance/suggestion box will be provided at the site offices. Complaint forms can be filled out and submitted to the site offices, CH&PA Community Development Department Camp Street sub-office grievance/suggestion box. verbal complaints or inquiry can be made to the Environmental and Social Safeguard Technical Officer or to the onsite Supervisory team in your area or on telephone number 223-1027/28 Extension 210 or 211 respectively.

Community	Community Response	CH&PA Response
Ms. Shonette Tross, Resident- 703 Covent Garden	I recently constructed three (3) concrete bridges at my property. My house lot is located on a corner opposite the playfield. As it pertains to infrastructure upgrades within my section. Would all three of my concrete bridges if impacted be replaced to the standard or better?	**Anthony Ragnauth, Senior Engineer, CH&PA:** once the bridges are dismantled it will be replaced to the standard or better. **Mr. Christopher Singh. Environment and Social Safeguard Technical Officer, CH&PA:** the dismantling of the resident's bridge is the last resort. In most cases if we can work with the existing structure, then there is no need to dismantle the bridge. However, in cases where the bridge has to be dismantled a temporary access to the property will be provided until the works are completed. The Project Affected Persons (PAPs) are usually notified within 14days before their bridge is dismantled. Which requires the signature of the PAP.
	What does the home owner have to do to ensure that their bridge (s) are replaced to the its quality standard?	**Mr. Christopher Singh. Environment and Social Safeguard Technical Officer, CH&PA:** the project has a grievance redress mechanism which addresses matters as it relates to the project and the PAP being dissatisfied.
	Can the residents expect reinforced concrete drains as shown in the pictures?	**Anthony Ragnauth, Senior Engineer, CH&PA:** Yes, as part of the scope of works reinforced concrete drains and sidewalks will be built in your area.

Ms. Tracey Fanfair, Resident- 1065 Covent Garden	We are located along the main access road at a four corner. The main concern is the condition of the main access road. The traversing of the heavy-duty machines and vibrations has left the road in a deplorable state. The structural integrity (foundation) of the resident's houses is at risk. Will any works be done at the main access road?	**Mr. Anthony Ragnauth, Senior Engineer, CH&PA:** As part of contract, maintenance work will have to be done on the access road that will be used to conduct the project. However, since it is an IDB project CH&PA has earmarked several roads within Covent Garden, Farm, Providence etc. to be constructed. However, the main access road may fall under the GOG for infrastructure upgrades. As it pertains to the Sophia the first project site, remedial works were done to the roads that were used at the end of the project. As such, the same will be done in your area once the project is completed. As result, of several road projects happening simultaneously the CH&PA cannot identify whether all of the trucks traversing the area everyday are from the AHUAP that are also contributing to the deplorable state of the road. **Mr. Christopher Singh. Environment and Social Safeguard Technical Officer, CH&PA:** as part of the program requirement, the contractors are required to employ local people or laborers in the community under the AHUAP
Mr. Raoul Forte, Resident- Farm Phase 2	When is the project expected to commence?	**Mr. Anthony Ragnauth, Senior Engineer, CH&PA:** the project is expected to commence within the first quarter of 2023.
Livelihood disruption and Grievance Mechanism	***Mrs. Donell Bess-Bascom, Deputy Director, Community Development.*** • What the CH&PA does practice is to ensure that the residents are adequately notified through the distribution of notification of works letters. The letters would usually state the duration of the project, expected impact and mitigation measures. This is the first of many engagements which will be continued throughout the project cycle. The CDD, is responsible to ensure that the grievance box is checked on a weekly basis. Once grievance forms are retrieved a follow up will be done to ensure the grievance is addressed and closed. **Mr. Christopher Singh. Environment and Social Safeguard Technical Officer.** • As Part of the project development process, some disruption will happen. For example, during for the construction of the roads some bridges or businesses will be disrupted. To minimize the impact of this disruption CH&PA will develop a Livelihood Restoration plan to address these issues, where they may occur • The inflow and outflow of traffic may also be disrupted during road construction. CH&PA will develop alternative routes to address these and the necessary changes will be communicated to the residents.	

	• Information will be communicated through social media platform, flyers, and various community groups.
Community Participation	***Mrs. Donell Bess-Bascom, Deputy Director, Community Development*** • As a requirement of the programme, a community-based project monitoring committee will be established. This committee will include at least two (2) members from the Faith-based Organizations, Local Democratic Organ, Community Groups, and Community-based Organizations etc. which will represent the six pre-selected housing areas before the project commence in the first quarter. This was done in Sophia and La Parfaite Harmonie • Throughout, the project cycles the members will be engaged through meetings on a monthly basis with the project team for updates on the progress of the project. Also, the project team will be noting the issues and concerns raised as it relates to the project. • The committee will represent the interest of a particular group that can support softer development initiatives. The committee can also be used as a medium to assist in the dissemination of information
Closing Remarks	Mrs. Donell Bess-Bascom in her closing remarks thank the residents for attending this informative session. Mrs. Bess-Bascom indicated that the CH&PA will be conducting a Women's Safety Audit (WSA), and Environment and Social Assessment (ESA) public disclosure meeting which will further update the residents on the project and the outcome of the study. Meeting adjourned 4:06pm

Prepared by: Carnesehia Pereira *(Scribe)*
Community Development Officer 11

Annex 2-F: Public Consultation Invitation and Notices

Ministry of Housing and Water

Central Housing and Planning Authority

Adequate Housing and Urban Accessibility Program

Community Wide Consultation

For the communities of :

Plot 'C' Herstelling

Farm Phases 1 and 2

Covent Garden

Saturday 19th November, 2022

From 2:00pm-4:30pm

At the Peter's Hall Primary School

Chairperson:Mrs.Donell Bess-Bascom
Deputy Director, Community Development ,CH&PA

Ministry of Housing and Water

Central Housing and Planning Authority

Adequate Housing and Urban Accessibility Program

Community Wide Consultation

Saturday 19th November, 2022

From 9:00am-11:00am

For the communities of

Peter's Hall

Perserverance

Providence Phase 2(North and South)

At the Peter's Hall Primary School

Chairperson:Mrs.Donell Bess-Bascom
Deputy Director, Community Development ,CH&PA

Saturday 19th November, 2022

e:00am-9:10am **Welcome & Opening Remark**
Mrs. Donell.B-Bascom
Deputy Director, Community Development,CH&PA

9:10am-9:20am **Overview of the AHUAP**
Mr.Sherwyn Greaves
Chief Executive Officer,CH&PA

9:20am-09:40am **Component 1.1: Affordable and Sustainable Housing Update on the Core Home Support and Home Improvement Subsidy**
Mr. Marlon Laing,
Project Support Facilitator ,Community Developmnet,CH&PA

9:40am-10:05am **Component 1.2: Implementation support and institutional strengthening ,Update on Infrastructural Works**

Mr. Anthony Ragnauth
Senior Engineer, Projects Department,CH&PA
And
Mr. Christopher Singh
Environmental Social, Safeguard Officer ,ProjectDepartment,CH&PA

10:05am-11:00am **Discussion** **All**

Saturday 19th November, 2022

2:00pm-2:10pm **Welcome & Opening Remark**
Mrs. Donell.B-Bascom
Deputy Director, Community Development,CH&PA

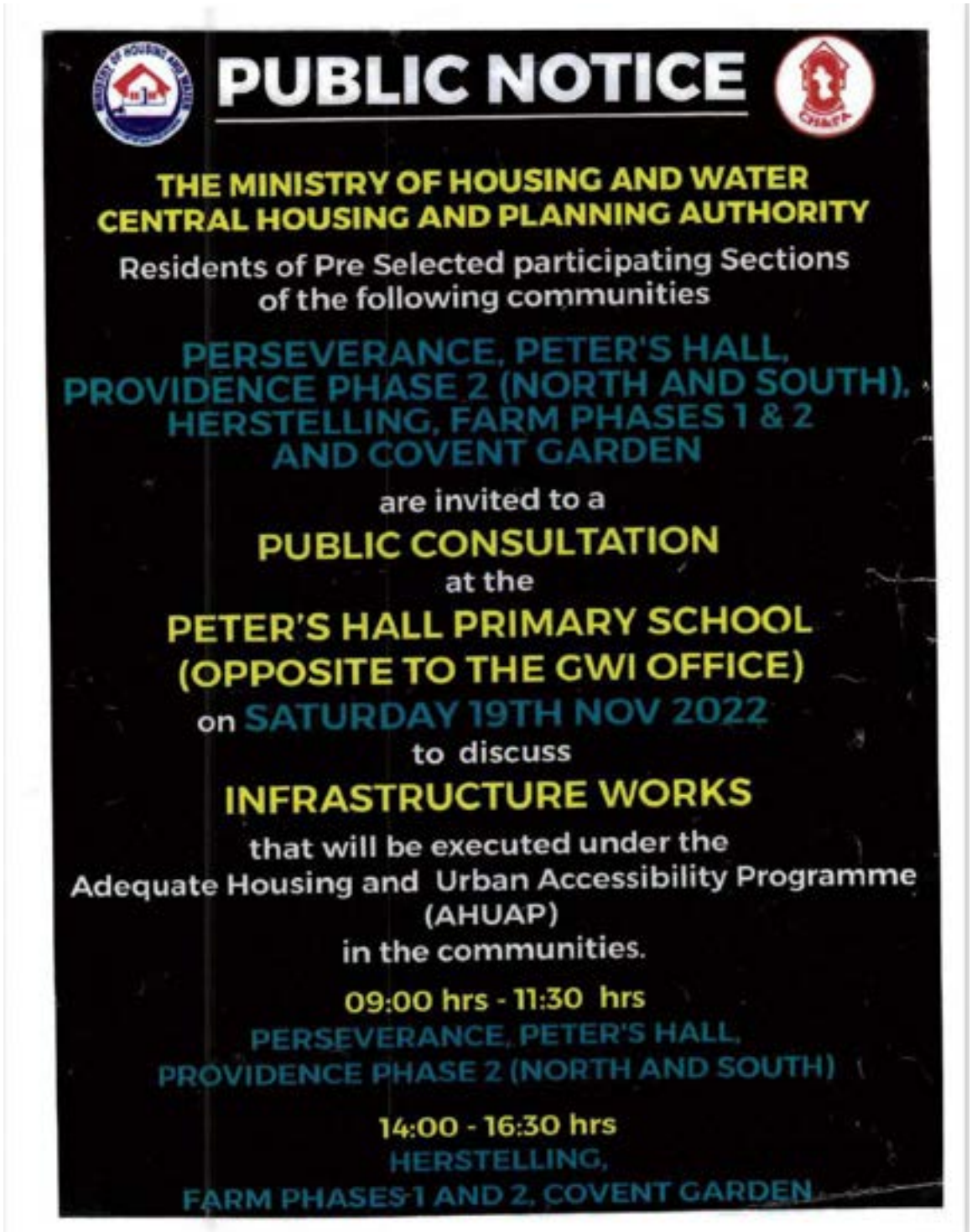
2:10pm –2:20pm **Overview of the AHUAP**
Mr.Sherwyn Greaves
Chief Executive Officer,CH&PA

2:20pm-2:40pm **Component 1.1: Affordable and Sustainable Housing Update on the Core Home Support and Home Improvement Subsidy**
Mr. Marlon Laing,
Project Support Facilitator, Community Developmnet,CH&PA

2:40pm-3:00pm **Component 1.2: Implementation support and institutional strengthening , Update on Infrastructural Works**

Mr. Anthony Ragnauth
Senior Engineer, Projects Department,CH&PA
And
Mr. Christopher Singh
Environmental Social, Safeguard Officer ,ProjectDepartment,CH&PA

3:00pm-4:30pm **Discussion**


PUBLIC NOTICE
THE MINISTRY OF HOUSING AND WATER
CENTRAL HOUSING AND PLANNING AUTHORITY
Residents of Pre Selected participating Sections
of the following communities
PERSEVERANCE, PETER'S HALL,
PROVIDENCE PHASE 2 (NORTH AND SOUTH),
HERSTELLING, FARM PHASES 1 & 2
AND COVENT GARDEN
are invited to a
PUBLIC CONSULTATION
at the
PETER'S HALL PRIMARY SCHOOL
(OPPOSITE TO THE GWI OFFICE)
on SATURDAY 19TH NOV 2022
to discuss
INFRASTRUCTURE WORKS
that will be executed under the
Adequate Housing and Urban Accessibility Programme
(AHUAP)
in the communities.
09:00 hrs - 11:30 hrs
PERSEVERANCE, PETER'S HALL,
PROVIDENCE PHASE 2 (NORTH AND SOUTH)
14:00 - 16:30 hrs
HERSTELLING,
FARM PHASES 1 AND 2, COVENT GARDEN

PUBLIC NOTICE

THE MINISTRY OF HOUSING AND WATER
CENTRAL HOUSING AND PLANNING AUTHORITY

invites the women of the preselected sections of

PLN. PERSEVERANCE

to participate in a

WOMEN'S SAFETY AUDIT (WSA).

under the

ADEQUATE HOUSING & URBAN ACCESSIBILITY PROGRAM

This activity is geared at assessing the safety of women in the preselected sections earmarked for infrastructure upgrades. The activity is scheduled to be held on

26th NOV. 2022 from 1:00pm - 5:30pm

at the

PERSEVERANCE COMMUNITY PLAYGROUND.

592-223-1027
592-223-1028

info@chpa.gov.gy
www.chpa.gov.gy

237 Camp Street
Georgetown, Guyana

PUBLIC NOTICE

THE MINISTRY OF HOUSING AND WATER

CENTRAL HOUSING AND PLANNING AUTHORITY

Invites residents of HERSTELLING Plot 'C'

to participate in a

COMMUNITY WIDE CONSULTATION AND

WOMEN'S SAFETY AUDIT (WSA)

Under the

ADEQUATE HOUSING & URBAN ACCESSIBILITY PROGRAM

This activity is geared at discussing infrastructure works that will be executed within the preselected section of the community and assessing the safety of women in these sections.

Date: Saturday, 29th April, 2023
Time: 1:00pm - 5:30pm
Venue: Parcel 2219 Herstelling Plot 'C'
(Community Playground)

592-223-1027
592-223-1028

info@chpa.gov.gy
WWW.chpa.gov.gy

237 Camp Street
Georgetown,Guyana

Ministry of Housing and Water
Central Housing and Planning Authority
Adequate Housing and Urban Accessibility Program
Women's Safety Audit
Perseverance

To Whom It May Concern

The Government of Guyana (GoG) through a loan from the Inter-American Development Bank (IDB) is implementing the Adequate Housing and Urban Accessibility Program (AHUAP) through the Ministry of Housing and Water (MoHW), Central Housing and Planning Authority (CHPA). The duration of the project spans December, 2017 to June, 2024.

In recognition of the above, six (6) Housing Areas along the East Bank Demerara, corridor was identified as the third project site where upgrade interventions will be conducted under the AHUAP. As per programme requirement, a Women's Safety Audit (WSA) is done to assess the safety of a particular space. It is a process that involves a small group of women who, with the help of a checklist, assess specific elements of the built and social environment to evaluate the extent to which each element contributes to or hinders their sense of safety. Further, the women then brainstorm ideas for making improvements to the space to make it feel safer, and partner with local stakeholders, including government, to implement change. A key result of this is that the AHUAP interventions in the community considers, the recommendation made in the WSA, and, where appropriate, includes these in the scope of works for the project site.

As such, CHPA will be facilitating a WSA in Perseverance on Saturday the 26th November, 2022 at the Perseverance Community playground from 1:00pm-5:30pm. This activity will be targeting the community leaders, adult women and young girls between the age of 13-17 years. The aim is to garner their perspective and recommendations on the safety of their environment. The CHPA is therefore, requesting the permission of the Parent (s)/ Guardian to have the participation and the photo of your child be taken at this activity for the purpose of reporting on the WSA.

I/We, _____ the parent(s) or legal guardian(s)

of:(**Child's Full Name**) _____ hereby agree that she has my/our consent

to participate in the Women's Safety Audit being conducted in Perseverance on the 26th

November, 2022 and to have photographs taken for reporting purposes.

Name of Parent (s): _____

Signature of Parent (s)/Legal Guardian (s): _____ Date: _____

CENTRAL HOUSING & PLANNING AUTHORITY
41 Brickdam and United Nations Place,
Stabroek, Georgetown.
Tel: 225-9155/227-3647 ext 205-204
Email: sherwynp@chpa.gov.gy

18th January, 2023

Dear Resident,

Adequate Housing and Urban Accessibility Program-Community Consultation Activity

The Adequate Housing and Urban Accessibility Program (AHUAP) is being implemented by the Central Housing and Planning Authority (CH&PA). The aim of the reformulated program (AHUAP) is to improve the quality of life in Urban and peri -urban Georgetown through better access to adequate housing and basic infrastructure for low-income populations, and through improved accessibility and mobility services.

Under the program, a total of six (6) housing schemes namely; Herstelling Plot C, Peter's Hall Phase 1, Providence Phase 2 (North and South), Perseverance, Farm Phases 1 & 2 and Covent Garden along the corridor of the East Bank of Demerara (EBD) were identified as the third project site where infrastructure upgrade interventions will be conducted. Your area has been selected to benefit from infrastructure upgrade works. As per programme requirement a Community Wide Consultation was facilitated on the 19th November, 2022 at the Peter's Hall Primary School.

In an effort to ensure that residents from your community are fully informed about the AHUAP's Scope of Works, CH&PA through its Community Development Department (CDD) will be conducting a public sensitization exercise in the areas where works are being executed.

CH&PA is cordially inviting you to participate in this activity by the receiving of the AHUAP information booklet and Community Consultation response sheet, filling out the response sheet and returning same to the CH&PA Officer that will visit you.

The CH&PA team will be in the area next week Saturday 4th February, 2023 from 9:00 hrs-17:00 hrs. to receive the community consultation response sheets from your residence. Alternatively, the response sheet, can also be dropped off at the CH&PA-Sub office (Formerly SIMAP Building, next to Saint Margaret's Primary School), 237 Camp Street, Georgetown before the 4th February, 2023.

Please see attached the following documents:
-Adequate Housing and Urban Accessibility Program, Information Booklet
-Community Consultation response sheet

Should you require any additional information or clarification, please feel free to contact any of the following persons: **Ms. Shennel Moore, Community Development Officer III or Ms. Carnesehia Pereira , Community Development Officer II on Telephone number 223-1027; extension 210 or 202 or 632-0796 or 632-0809. The officers can also be reached via e-mail as follows: shennelm@chpa.gov.gy or carnesehiap@chpa.gov.gy, respectively.**

Looking forward for your participation.

CENTRAL HOUSING & PLANNING AUTHORITY
41 Brickdam and United Nations Place,
Stabroek, Georgetown.
Tel: 225-9155/227-3647 ext 205-204
Email: sherwynp@chpa.gov.gy

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Looking forward for your participation.

ANNEX 3: Code of Conduct for Workers

Company Code of Conduct
Implementing ESHS and OHS Standards
Preventing Gender Based Violence

The company is committed to ensuring that the project is implemented in such a way which minimizes any negative impacts on the local environment, communities, and its workers. This will be done by respecting the environmental, social, health and safety (ESHS) standards, and ensuring appropriate occupational health and safety (OHS) standards are met. The company is also committed to creating and maintaining an environment where children under the age of 18 will be protected, and where Sexual Exploitation and Abuse (SEA) and sexual harassment have no place. Improper actions towards children, SEA and sexual harassment are acts of Gender Based Violence (GBV) and as such will not be tolerated by any employee, sub-contractors, supplier, associate, or representative of the company.

Therefore, to ensure that all those engaged in the project are aware of this commitment, the company commits to the following core principles and minimum standards of behavior that will apply to all company employees, associates, and representatives, including sub-contractors and suppliers, without exception:

General

1. The company—and therefore all employees, associates, representatives, sub-contractors and suppliers—commits to complying with all relevant national laws, rules and regulations.
2. The company commits to treating women, children (persons under the age of 18), and men with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status. Acts of GBV are in violation of this commitment.
3. The company shall ensure that interactions with local community members are done with respect and non-discrimination.
4. Demeaning, threatening, harassing, abusive, culturally inappropriate, or sexually provocative language and behavior are prohibited among all company employees, associates, and its representatives, including sub-contractors and suppliers.
5. The company will follow all reasonable work instructions (including regarding environmental and social norms).
6. The company will protect and ensure proper use of property (for example, to prohibit theft, carelessness or waste).

Health and Safety

7. The company will ensure that the project's OHS Management Plan is effectively implemented by company's staff, as well as sub-contractors and suppliers.

8. The company will ensure that all persons on-site wear prescribed and appropriate personal protective equipment, preventing avoidable accidents, and reporting conditions or practices that pose a safety hazard or threaten the environment.
9. The company will:
    i. prohibit the use of alcohol during work activities.
    ii. prohibit the use of narcotics or other substances which can impair faculties at all times.
10. The company will ensure that adequate sanitation facilities are available on site and at any worker accommodations provided to those working on the project.
11. The company will not hire children under the age of 18 for construction work, or allow them on the work site, due to the hazardous nature of construction sites.

Gender Based Violence

12. Acts of GBV constitute gross misconduct and are therefore grounds for sanctions, which may include penalties and/or termination of employment and, if appropriate, referral to the Police for further action.
13. All forms of GBV, are unacceptable, regardless of whether they take place on the work site, the work site surroundings, at worker's camps or within the local community.
14. Sexual harassment of work personnel and staff (e.g. making unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct of a sexual nature) are acts of GBV and are prohibited.
15. Sexual favors (e.g. making promises of favorable treatment such as promotions, threats of unfavorable treatment such as losing a job, payments in kind or in cash dependent on sexual acts) and any form of humiliating, degrading or exploitative behavior are prohibited.
16. Unless there is full consent[10] by all parties involved in the sexual act, sexual interactions between the company's employees (at any level) and members of the communities surrounding the work place are prohibited. This includes relationships involving the withholding/promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex (including prostitution). Such sexual activity is considered "non-consensual" within the scope of this Code.
17. In addition to company sanctions, legal prosecution of those who commit acts of GBV will be pursued if appropriate.

[10] **Consent:** refers to when an adult makes an informed choice to agree freely and voluntarily to do something. There is **no** consent when agreement is obtained through the use of threats, force or other forms of coercion, abduction, fraud, manipulation, deception, or misrepresentation; the use of a threat to withhold a benefit to which the person is already entitled, or; a promise made to the person to provide a benefit. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of 18, even if national legislation of the country into which the Code of Conduct is introduced has a lower age. Mistaken belief regarding the age of the child and consent from the child is not a defense.

18. All employees, including volunteers and sub-contractors are highly encouraged to report suspected or actual acts of GBV by a fellow worker, whether in the same company or not. Reports must be made in accordance with project's GBV Allegation Procedures.
19. Managers are required to report and act to address suspected or actual acts of GBV as they have a responsibility to uphold company commitments and hold their direct reports responsible.

Implementation

To ensure that the above principles are implemented effectively the company commits to:

20. Ensuring that all managers sign the project's 'Manager's Code of Conduct' detailing their responsibilities for implementing the company's commitments and enforcing the responsibilities in the 'Individual Code of Conduct'.
21. Ensuring that all employees sign the project's 'Individual Code of Conduct' confirming their agreement to comply with ESHS and OHS standards, and not to engage in activities resulting in GBV, child endangerment or abuse, or sexual harassment.
22. Displaying the Company and Individual Codes of Conduct prominently and in clear view at workers' camps, offices, and in in public areas of the work space. Examples of areas include waiting, rest and lobby areas of sites, canteen areas and health clinics.
23. Ensuring that posted and distributed copies of the Company and Individual Codes of Conduct are translated into the appropriate language of use in the work site areas as well as for any international staff in their native language.
24. Ensuring that an appropriate person is nominated as the company's 'Focal Point' for addressing GBV issues, including representing the company on the GBV Complaints Team (GCT) which is comprised of representatives from the client, contractor(s), the supervision consultant, and local GBV Service Provider.
25. Ensuring that all employees attend an induction training course prior to commencing work on site to ensure they are familiar with the company's commitments to ESHS and OHS standards, and the project's GBV Codes of Conduct.
26. Ensuring that all employees attend a mandatory training course once a month for the duration of the contract starting from the first induction training prior to commencement of work to reinforce the understanding of the project's ESHS and OHS standards and the GBV Code of Conduct.

I do hereby acknowledge that I have read the foregoing Company Code of Conduct, and on behalf of the company agree to comply with the standards contained therein. I understand my role and responsibilities to support the project's OHS and ESHS standards, and to prevent and respond to GBV. I understand that any action inconsistent with this Company Code of Conduct or failure to act mandated by this Company Code of Conduct may result in disciplinary action.

Company name: _____

Signature: _____

Printed Name: _____

Title: _____

Date:

Individual Code of Conduct
Implementing ESHS and OHS Standards
Preventing Gender Based Violence

I, _____, acknowledge that adhering to environmental, social, health and safety (ESHS) standards, following the project's occupational health and safety (OHS) requirements, and preventing Gender Based Violence (GBV) is important.

The Company considers that failure to follow ESHS and OHS standards, or to partake in activities constituting GBV—be it on the work site, the work site surroundings, at workers' camps, or the surrounding communities—constitute acts of gross misconduct and are therefore grounds for sanctions, penalties or potential termination of employment. Prosecution by the Police of those who commit GBV may be pursued if appropriate.

I agree that while working on the project I will:

1. Consent to Police background check.
2. Attend and actively partake in training courses related to ESHS, OHS, and GBV as requested by my employer.
3. Will wear my personal protective equipment (PPE) at all times when at the work site or engaged in project related activities.
4. Take all practical steps to implement the contractor's environmental and social management plan (C-ESMP).
5. Implement the OHS Management Plan.
6. Adhere to a zero-alcohol policy during work activities, and refrain from the use of narcotics or other substances which can impair faculties at all times.
7. Treat women, children (persons under the age of 18), and men with respect regardless of race, color, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status.
8. Not use language or behavior towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
9. Not sexually exploit or abuse project beneficiaries and members of the surrounding communities.
10. Not engage in sexual harassment of work personnel and staff —for instance, making unwelcome sexual advances, requests for sexual favors, and other verbal or physical conduct

of a sexual nature is prohibited. E.g. looking somebody up and down; kissing, howling or smacking sounds; hanging around somebody; whistling and catcalls; in some instances, giving personal gifts.

11. Not engage in sexual favors —for instance, making promises of favorable treatment (e.g. promotion), threats of unfavorable treatment (e.g. loss of job) or payments in kind or in cash, dependent on sexual acts—or other forms of humiliating, degrading or exploitative behavior.
12. Unless there is the full consent[11] by all parties involved, I will not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex (including prostitution). Such sexual activity is considered "non-consensual" within the scope of this Code.
13. Consider reporting through the GRM or to my manager any suspected or actual GBV by a fellow worker, whether employed by my company or not, or any breaches of this Code of Conduct.

Sanctions

I understand that if I breach this Individual Code of Conduct, my employer will take disciplinary action which could include:

1. Informal warning.
2. Formal warning.
3. Additional Training.
4. Loss of up to one week's salary.
5. Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.
6. Termination of employment.
7. Report to the Police if warranted.

I understand that it is my responsibility to ensure that the environmental, social, health and safety standards are met. That I will adhere to the occupational health and safety management plan. That I will avoid actions or behaviors that could be construed as GBV. Any such actions will be a breach this Individual Code of Conduct. I do hereby acknowledge that I have read the foregoing Individual Code of Conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to ESHS, OHS, GBV issues. I understand that any action inconsistent with this Individual Code of Conduct or failure to act mandated by this

[11] **Consent** is defined as the informed choice underlying an individual's free and voluntary intention, acceptance or agreement to do something. No consent can be found when such acceptance or agreement is obtained using threats, force or other forms of coercion, abduction, fraud, deception, or misrepresentation. In accordance with the United Nations Convention on the Rights of the Child, the World Bank considers that consent cannot be given by children under the age of 18, even if national legislation of the country into which the Code of Conduct is introduced has a lower age. Mistaken belief regarding the age of the child and consent from the child is not a defense.

Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.

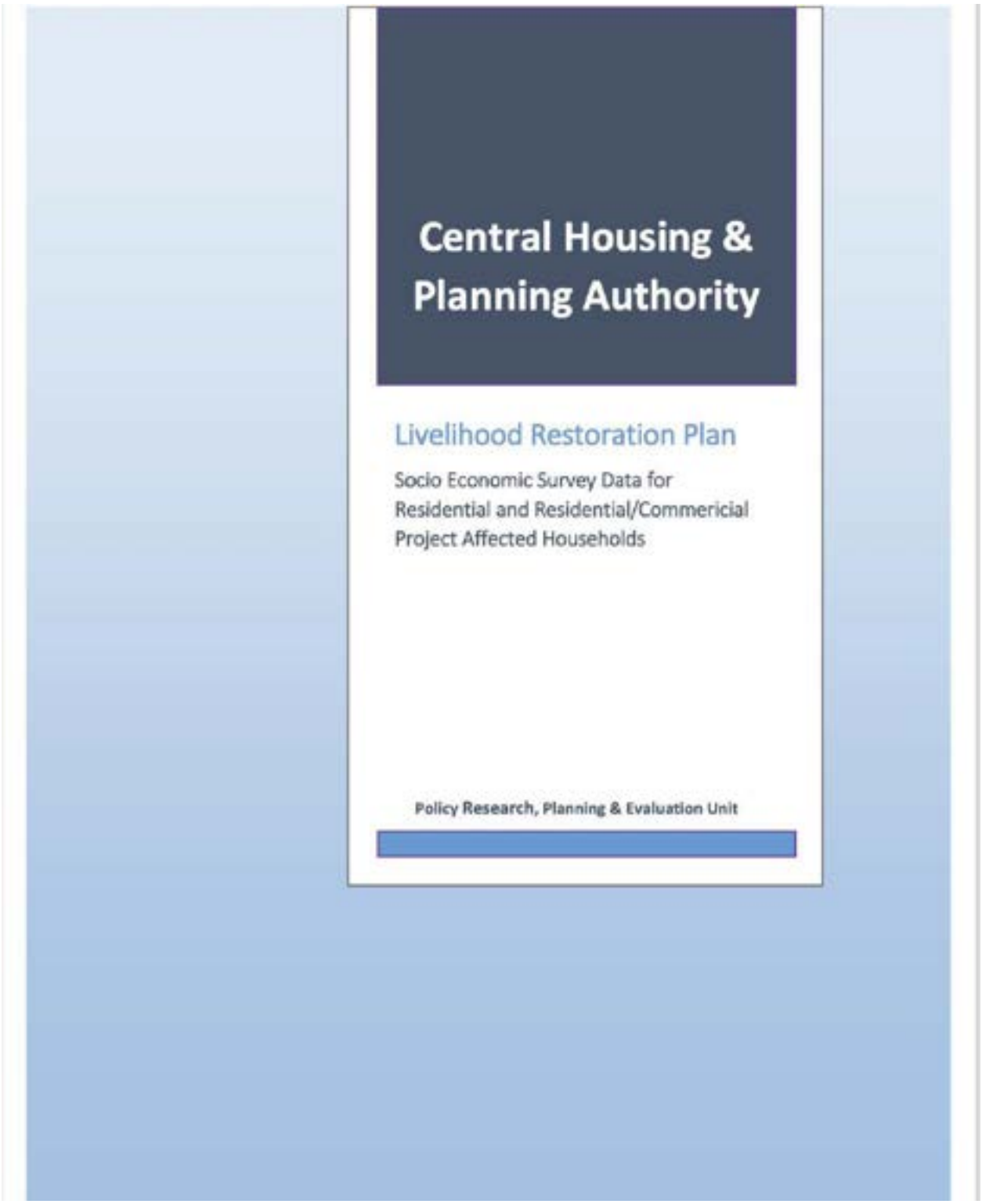
Signature: _____

Printed Name: _____

Title: _____

Date: _____

ANNEX 4: Livelihood Restoration Plan


Central Housing &
Planning Authority
Livelihood Restoration Plan
Socio Economic Survey Data for
Residential and Residential/Commericial
Project Affected Households
Policy Research, Planning & Evaluation Unit

Contents

Project Affected Households: Residential Commercial

Socio – Economic Survey

The survey was executed in Providence, Herstelling, Farm and Covent Garden on the East Bank of Demerara. A total of eleven **(11)** interviews were done, and the data was then compiled using the statistical package for social sciences.

Occupant Details

Area /Type or Tenure

Area	Type Tenure			Total
	Owner of Property	Care Taker	Staying with family/friend	
Providence Phase 2 North & South	1	1	0	2
Herstelling Plot 'C'	1	0	0	1
Farm Phase 2	2	0	0	2
Covent Garden	5	0	1	6
Total	**9**	**1**	**1**	**11**

Commercial Activity Details

Ownership of Business

Do you own the Business?	Frequency	Percent
Yes	9	81.8
Religious/Institutional (N/A)	2	18.2
Total	**11**	**100.0**

NB: There are only nine **(9)** businesses. A children's home and a church are the other commercial activities.

Type of Commercial Activity

Nature of Business	Frequency	Percent
Grocery Shop	3	27.3
Snackette	2	18.2
Variety Shop	1	9.1
Key Cutting Shop	1	9.1
General Shop	1	9.1
Beverage Distributor	1	9.1
Institutional	1	9.1
Religious	1	9.1
Total	**11**	**100.0**

Duration of Business Operation

Duration of Business	Frequency	Percent
Less than 1 year	6	54.5
1 - 3 years	5	45.5
Total	**11**	**100.0**

Business Licensed/Registered

Business Licensed or Registered	Frequency	Percent
Yes	6	54.5
No	3	27.3
Religious/Institutional (N/A)	2	18.2
Total	**11**	**100.0**

Number of Days Business Operates

Number of days Business Operates	Frequency	Percent
Religious/Institutional (N/A)	2	18.2
2	1	9.1
4	2	18.2
5	1	9.1
6	1	9.1
7	3	27.3
Depends on orders	1	9.1
Total	**11**	**100.0**

Number of Hours Business Operates

Number of Hours Business Operates	Frequency	Percent
Religious/Institutional (N/A)	2	18.2
11	2	18.2
13	2	18.2
14	1	9.1
15	1	9.1
6	2	18.2
Depends on orders	1	9.1
Total	**11**	**100.0**

Average Daily Income

Daily Income Ranges	Frequency	Percent
$1001 - $5000	4	36.4
$5001 - $10,000	3	27.3
$10,001 - $15,000	1	9.1
$15,001 - $20,000	1	9.1
Religious/Institutional (N/A)	2	18.2
Total	**11**	**100.0**

Average Monthly Income

Monthly Income Ranges	Frequency	Percent
$60,000 and less	2	18.2
$60,001 - $100,000	2	18.2
$150,000 - $200,000	1	9.1
$200,001 - $250,000	1	9.1
$250,001 - $500,000	3	27.3
Religious/Institutional (N/A)	2	18.2
Total	**11**	**100.0**

Any other source of Income

Any other source of Income	Frequency	Percent
Yes	2	18.2
No	7	63.6
Religious/Institutional (N/A)	2	18.2
Total	**11**	**100.0**

How much is made from the other source of income

- 30,000 monthly – Care of elderly man
- 139,000 monthly – Teacher

Family Structure

Gender of Head of Household

Of the persons who responded to this inquiry, most of the households were headed by a female. This represents **6** households or **54.5%** and **4 (36.4%)** households being headed by a male.

Gender of the Head of the Household	Frequency	Percent

Male	4	36.4
Female	6	54.5
Religious (N/A)	1	9.1
Total	**11**	**100.0**

Type of Family

Type of Family	Frequency	Percent
Nuclear	3	27.3
Single Parent	2	18.2
Extended	4	36.4
Other	1	9.1
Religious (N/A)	1	9.1
Total	**11**	**100.0**

Number of persons in Household

A total of eleven (**11**) households were interviewed. In the eleven (**11**) households there are forty-two (**42**) persons and the average of persons living in a household is **3.8**.

Number of Persons in the Household	Frequency	Percent
Religious (N/A)	1	9.1
2	3	27.3
3	1	9.1
5	1	9.1
6	3	27.3
8	1	9.1
12	1	9.1
Total	**11**	**100.0**

Age of Household Members

38.1% of household members are below the age of 16. Twenty-one (**21**) or **50%** of household members are of employable age (16-60). Three (**3**) or **7.1%** of households are above the age of 60.

Age Range	# of Persons
Below 16	16
16-29	13
30-39	3
40-49	5
50-59	0

Age Range	# of Persons
60-69	2
70-79	1
80-89	1
90-100	1
Total	**42**

The two tables below illustrate the disaggregation of household members by gender.

Age Range	# of Males
Below 16	7
16-29	4
30-39	2
40-49	3
50-59	0
60-69	1
70-79	1
80-89	0
90-100	1
Total	**19**

Age Range	# of Females
Below 16	9
16-29	9
30-39	1
40-49	2
50-59	0
60-69	1
70-79	0
80-89	1
90-100	0
Total	**23**

The table below shows the disaggregation of household members who are 15 years old and below.

Age Range	# of Children
0 to 3	1
4 to 6	1
7 to 11	5
12 to 15	9
Total	**16**

Number of persons with Disability

Five **(5)** household members from the Ruimveldt Parent Group have disabilities, all members are under the age of 18. Two **(2)** females have chronic illnesses, age 25 has kidney disease and is currently on dialysis and age 65 has kidney disease and cancer.

How will a disruption to the commercial asset affect you?

Below are the general comments made by respondents of this inquiry;

- Would not affect me
- It will be a great relief to persons

- A disruption to the shed will cause rain to blow in the shop and flood it
- Delivery vehicles will be disrupted from delivering supplies
- The dust will affect us
- Would not be able to do distributions and customers won't be able to come to the shop

Other Remarks

- Happy for the road to be done
- Need the road
- Hoping to get more sales
- Do the road quick
- Would like a copy of the map of the area

Project Affected Households: Residential

Socio-Economic Survey

The survey was executed in Peter's Hall, Providence Phase 2 North and South, Herstelling Plot 'C' and Covent Garden Housing Scheme A total of **30** interviews were done, the data was then compiled using the statistical package for social sciences. It should be noted that for the eight **(8)** lots where no information was collected; three **(3)** of the houses were under construction, and four **(4)** persons were not at home (a field visit was also done for the second time on Sunday, November 6th, 2022 to persons who were not at home during the first field visit) and one **(1)** house was unoccupied.

Areas	Frequency	Percent
Peter's Hall	3	10.0
Providence Ph2 North and South	4	13.3
Herstelling Plot 'C'	9	30.0
Covent Garden Housing Scheme	14	46.7
Total	**30**	**100.0**

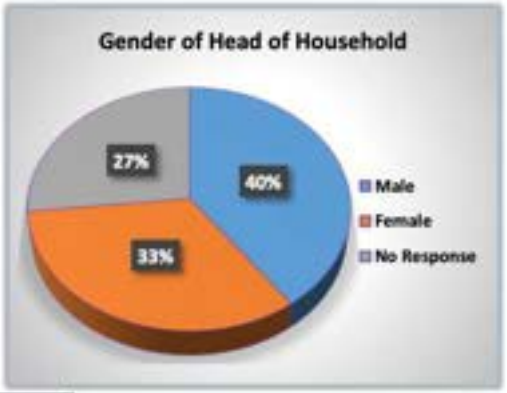
Areas	Number of PAHs	Number of Interviewed/ Surveyed PAHs	% PAHs interviewed / surveyed
Peter's Hall	3	2	66.7%
Providence North & South Phase 2	4	3	75%
Herstelling Plot 'C'	9	8	88.9%
Covent Garden	14	9	64.3%
Total	**30**	**22**	**73.3%**

Family Structure

Gender of Head of Household

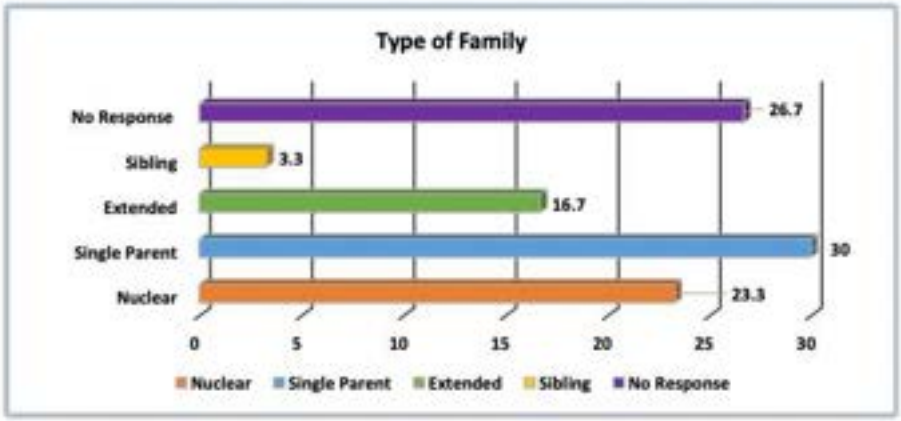
Of the persons who responded to this inquiry, more than half of the households were headed by a male. This represents **12** households or **40%**, with **10 (33.3%)** households being female-headed.

Gender of the head of Household	Frequency	Percent
Male	12	40.0
Female	10	33.3
No Response	8	26.7
Total	**30**	**100.0**



Type of Family

Type of Family	Frequency	Percent
Nuclear	7	23.3
Single Parent	9	30.0
Extended	5	16.7
Sibling	1	3.3
No Response	8	26.7
Total	**30**	**100.0**



Number of persons in Household

A total of twenty-two (**22**) households were interviewed. In the twenty-two (**22**) households there are Sixty-three (**63**) persons and the average number of persons per household is **2.9**.

Number of persons living in your household	Frequency	Percent
1	1	3.3
2	5	16.7
3	3	10.0
4	8	26.7
5	2	6.7
6	2	6.7
7	1	3.3
No Response	8	26.7
Total	**30**	**100.0**

Age of Household Members

42.8% of household members are below the age of 16. Thirty (**30**) or **46.7%** of household members are of employable age (16-60). Six (**6**) or **9.5%** of household members are above the age of 60.

Age Range	# of Persons
Below 16	27
16-29	13
30-39	7
40-49	7
50-59	3
60-69	2
70-79	3
80-89	1
Total	**63**

The two tables below illustrate the disaggregation of household members by gender.

Age Range	# of Males
Below 16	17
16-29	5
30-39	2
40-49	3
50-59	1
60-69	0
70-79	0
80-89	0
Total	**28**

Age Range	# of Females
Below 16	10
16-29	8
30-39	5
40-49	4
50-59	2
60-69	2
70-79	3
80-89	1
Total	**35**

The table below shows the disaggregation of household members who are 15 years and below.

Age Range	# of Children
0 to 3	7
4 to 6	6
7 to 11	8
12 to 15	6
Total	**27**

Number of persons with a Disability

Four **(4)** household members have disabilities;

- Two **(2)** male household members have autism, their ages are 5 and 8 respectively.
- Two **(2)** household members has chronic illnesses, one female; age 25 has kidney disease and another female; age 73 has Alzheimer's.

Type of Tenure

Are you the owner of the Property	Frequency	Percent
Yes	16	53.3
No	6	20
No Response	8	26.7
Total	**30**	**100**

The majority of respondents own the home with exception of six **(6)** persons of whom; two **(2)** are renting, three **(3)** are staying with family/friends and one **(1)** person is living home.

If No, please state the type of tenure	Frequency	Percent
Renting	2	6.7
Staying with family/friends	3	10.0
Living home	1	3.3
Total	**6**	**100.0**

Structures to be affected by Infrastructure Works

Affected Structure	Frequency	Percent
Bridge Only	22	73.4
Fence	1	3.3
Bridge - walkway & driveway	7	23.3
Total	**30**	**100.0**

How will a disruption to the residential asset affect you?

Below are the general comments made by the twenty-two **(22)** respondents who were interviewed?

- Accessibility to property and parking inside the yard
- It will not affect me
- Moving the shed would cause rain to blow into the shop and cause flooding

- The dust will affect us

Other Remarks

Two (**2**) persons made 'other remarks' when asked if they had any other remarks;

- Water in drain stagnant. Please look into it
- Road is very bad

ANNEX 5: Traffic Management Plan

CHPA TRAFFIC MANAGEMENT PLAN

1.0 TRAFFIC MANAGEMENT ADMINISTRATION

Implementation of this Traffic Management Plan (TMP) is the responsibility of the respective Contractor through their Contractor Management Team (CMT) (See Section 4.2). Figure 1.1 outlines the organizational structure of the CMT for Traffic Management. The CH&PA through its CSMT will monitor the implementation of this TMP and provide guidance to ensure compliance with the Traffic Management Requirements herein (Chapter 1). All personnel engaged in the field activities will follow the correct work practices as required by this TMP

Figure 1.1 Traffic Management Hierarchy

Table 1.1 Traffic Management Administration (Contractor to fill out table 1.1)

Designation	Name	Contact
Site Engineer		
Environmental and Social Works Inspector		
Foreman		
Traffic Controllers		
Key Subcontractor and Workers		

2.0 GENERAL TRAFFIC CONTROL MEASURES FOR SITE

2.1 Introduction

The purpose of this section of the management plan is to assist users with uniform and consistent methods for installing traffic control devices, thus ensuring safety and minimizing inconvenience to both motorists and workers traversing in and around the project site. It is the responsibility of those working on the adjacent roadways to ensure that the principles and procedures contained within this section are applied with sound technical judgment, when providing safe traffic control in all other situations.

The appropriate level of traffic control for a situation shall be determined using the guidelines provided and sound technical judgment based upon a review of the work site and local traffic conditions. The decision to use a particular traffic device in a specific location must consider the local conditions at the project site and also at various phases of the project. There are some underlying principles that must be adhered to in administering the use of traffic control measures specific to any project site; those of which include, but are not limited to:

- All traffic signs used for temporary conditions are designed and installed for the safety and convenience of the traveling public and for the safety of the workers.
- Work sites shall be carefully checked to make sure that traffic controls are changed to suit changing construction conditions due to work staging and progress, or if an immediate improvement to the traffic control is needed. Any problems shall be dealt with immediately and documented
- All signs shall conform to the required standards in shape, colour, size and position as outlined by the Traffic Management Plan along with the local Road and Traffic Authority.
- Throughout the timeline of the construction project, including weekends and overnight works (if applicable), all temporary condition signage shall be securely installed on either portable sign supports or permanently installed sign supports.
- Poorly maintained, defaced, damaged, or dirty temporary condition signs are ineffective and shall be replaced, repaired, or cleaned without delay (usually within a 24hr period).
- No work will be permitted to commence until all traffic control devices are installed in position.
- After a work zone is completed all traffic signs used on that construction zone shall be removed immediately. Any installed signs not applicable during a phase of construction shall be removed or covered.
- Objects within the roadway or immediately adjacent to the roadway, which constitute a hazard to traffic shall be marked with a delineator device.
- Signs, barricades and channelization devices shall be reflectorized to show the same colour and shape by night as by day.

2.2 Interference with Traffic

The Contractor shall not close the road or reduce the width or number of traffic lanes available for traffic except as specified in the Contract or approved by the Engineer.

The Contractor shall at all times carry on the work in a manner that will create the least interference with traffic, consistent with the performance of the work.

Construction equipment shall not be parked in such a manner as to obscure or in any way block the road users' view of traffic control devices. Employee's vehicles may only be parked on the roadway if they are being used in the performance of the work.

The Contractor shall keep the travelled way free of foreign objects such as spilled earth, rock, timber and other items that may fall from his transporting vehicles. Materials spilled by or dropped along or across any public travelled roadway, both within and outside the contract limits, shall be removed immediately. The Contractor shall provide and maintain reasonable access to property fronting or in the vicinity of the work. Where temporary disruption of access is authorized by the Engineer, the Contractor shall make adequate arrangements with the affected property owners.

2.3 Control Measures

a) Signs

Signs shall be in reasonable condition to be effective for both day and night conditions. While signs cannot always be in new condition, signs should always be in reasonable condition. Unacceptable conditions that warrant replacing shall be those which are: covered in asphalt splatter, dirt, dust or snow; have several large abrasions or tears; have significant loss of lettering; lettering has been touched up or poorly modified; message is partly missing or illegible; have colour fading or loss of reflectivity.

Portable signs shall be placed on the roadway clear of normal vehicular traffic, stand vertically and be pinned or anchored so that wind gusts will not topple the sign. The bottom of the sign shall be at least 600mm above the surface of the road. The bottom of non-portable signs shall be at least 1,500mm above the surface of the road.

The edge of signs shall be clear of the road shoulder line by at least one metre and shall be clear of the edge of curbed roadways by at least 300mm in urban areas and 600mm in rural areas. Non-portable sign posts shall be wooden, capable of supporting the sign firmly at the required height and shall have a minimum nominal size of 100mm x 100mm.

In general, signs shall be positioned on the right-hand side of the road. When two or more adjacent lanes accommodate traffic travelling in the same direction, both non-portable and portable signs shall be positioned on both sides of the roadway.

Temporary Condition Signs shall have black symbols or lettering on an orange retro reflectorized High Intensity Prismatic background. The use of florescent paint on signage shall not be considered and is not acceptable (See Appendix A for typical construction TMP signs).

b) Designated Construction Zone (DCZ) and Construction Area Sign

All projects in urban areas lasting longer than four hours shall be signed as a Designated Construction Zone (DCZ). The Construction Area sign shall be used in advance of work areas which are separated by more than 5 km from the Gateway Assembly or from other work areas.

c) Hazard Markers

Where traffic has to be diverted or channelized to cross multi-lanes of paved surfaces, delineator devices, such as hazard markers and chevrons, may be installed as outlined in this section. Signs 300 mm or less in width shall be installed on a single piece of 25 mm rebar to a height of 1 m minimum above the travelled portion of the roadway to the bottom edge of the sign. Signs greater than 300 mm in width shall be installed on two pieces of 25 mm rebar to a height of 1 m minimum above the travelled portion of the roadway to the bottom edge of the sign.

d) Advanced Warning Area and Approach Areas

The advance area of any project site is the section of the roadway where motorists are first alerted about roadwork ahead. Signing in this area may begin up to 2km from the approach area and ending at a CONSTRUCTION AHEAD sign. The approach area is the section of the roadway where motorists are given final warning and information on what actions to take before entering the work zone. Signing in this area typically begins immediately following a CONSTRUCTION AHEAD sign and ends at the beginning of the buffer zone.

e) Buffer Zones, Work Zones and Taper

The buffer zone provides a space for protection for traffic and workers between the taper/transition area and the work zone. It is usually delineated by traffic devices. No work material, vehicles or equipment should be stored in the buffer zone. The taper or transition area is the section of the roadway where motorists are channelized from the normal alignment to proceed safely past the work zone. The taper is normally delineated with the use of pylons, construction markers, chevrons, drums or delineator posts. The transition area may include several diagonal and parallel sections to route vehicles to the location to bypass the work zone.

The work zone is that portion of the roadway which contains the work activity (workers, equipment, and construction materials). They may be fixed or moved as the work progresses. The area is usually delineated by channelizing devices or in some instances shielded by barriers.

f) Construction Zone Speed Limits – General Information

Speed limits must reflect the road conditions in existence at the time. Signs must be removed or changed immediately when the condition changes. When the road condition does not warrant reduced speed during non-working periods, overnight, or weekends, the signs shall be removed or covered. On a divided roadway, if construction involves only one lane, the speed limit will be lowered in the affected direction of travel only and will remain unaltered in the opposite direction. The reducing of a speed limit through the entire work project will not be permitted. Having each work zone individually considered, based on the general geometric conditions of the work zone, is the only acceptable method of speed limit signing.

All conflicting signs within the reduced speed zone shall be removed or covered while the temporary speed limit is in effect. Double fines apply in construction zones. In order for the regulations to be enforced the speed limit and the beginning and end of the construction zone must be marked.

All speed limits indicated on these signs shall be in 10 km/h increments. The Maximum Speed Ahead signs shall be placed 150 m to 250 m in advance of a construction speed sign where the speed reduction is more than 10 km/h.

Where the Maximum Speed Ahead sign is positioned in advance of normal temporary condition signage an advance "Construction Ahead" sign must be installed ahead of the speed ahead sign. At the end of the construction zone, which has a reduced speed limit posted, a speed limit sign shall be posted indicating a return to the normal speed limit on that particular section of roadway. This sign may be omitted if there exists a permanently installed speed limit sign within 300 m of the end of the reduced speed zone.

Table 2.1 Recommended sight distances for placement of various speed limit signs

Construction Zone Speed Limit	Sight Distance in each Direction
90 km/h	280m or greater
80 km/h	230m – 279m
70 km/h	200m – 229m
60 km/h	170m – 199m
50 km/h	140m – 169m
40 km/h	110m – 139m
30 km/h	Less than 109m

g) Delineation Devices

Delineation devices shall be used to channelize traffic when the traffic flow is impeded as a result of obstructions, work areas or a narrowing of the roadway. They form part of the general category called Traffic Control Devices and shall be used as a supplement to signs and barricades.

Where the temporary condition exists during darkness, delineation shall be achieved by the use of construction markers, traffic barrels, barricades, chevron markers, delineator posts, flashing beacons or similar devices. In all cases, markers and barricades used to achieve delineation during the hours of darkness shall be retro-reflectorized using high intensity. Delineators including all construction markers, chevrons, barricades etc. shall be in reasonable condition to be effective for both day and night conditions. While delineation devices cannot always be in new condition, they should always be in reasonable condition. Unacceptable conditions that warrant replacing shall be those which are: covered in asphalt splatter, dirt, dust or snow; have several large abrasions or tears; have deformation and dented considerably; have colour fading or loss of more than 20% of its reflectivity.

The centre to centre distance between delineators varies with the regulatory speed for both tapers and tangents. If the work area affects more than one traffic lane width, each traffic lane shall be closed separately and a tangent section provided between the two tapers. Minimum length of the tangent section shall be followed:

Table 2.2 Minimum length of the tangent section

Regulatory Speed Limit	Minimum Tangent between Tapers
50 km/h and less	50m
60 to 70 km/h	100m

80 km/h	150m
90 km/h or greater	240m

h) Barricades

For reasons of traffic safety and for the protection of workers, barricades shall be used to define the work area. Such protection is considered a part of the temporary signing arrangement. Barricades shall also be used to close streets or roads in the area where the work is being carried out. Barricades are always placed immediately preceding the work area on the approach side between the road user and the obstruction or activity. These barricades shall be reflectorized to indicate the same colour and shape by night as by day. The use of fluorescent paint on barricades shall not be considered for use after dark.

A barricade shall consist of one or more similar barricade assemblies placed end to end. When required, barricades shall be reflectorized on both sides.

Heavy barricades shall be used to provide complete closure of a road or lane for an extended period of longer than five days.

Light barricades shall be used for works of short duration to provide closure of a traffic lane or roadways or blocking off road excavation sites or other work site hazards. Light barricades shall not be used as a channelized device. The use of fluorescent paint on light barricades shall not be considered for use after dark.

i) Channelization Devices

Channelization devices shall be used when the traffic flow is impeded as a result of obstructions, work areas, or a reduction in the effective width of the roadway. They shall be used to supplement signs and barricades.

j) Construction Markers

Construction markers may be used to delineate obstructions above the ground, such as gravel windrows, and to delineate excavation areas below the ground level, such as bench cuts. They shall be mounted on suitable supports, with the bottom of the marker being approximately 900mm above the road surface. They shall be spaced in accordance with the approved Traffic Management Plan.

k) Chevron Markers

Chevron Markers shall be used on tapers for detours and diversions. They shall replace the normal construction marker at a spacing of every 30 m from the start of the taper. The arrow head shall point in the direction of the turn. They shall be retro-reflectorized using high intensity grade orange reflective sheeting to indicate the same colour and shape by night as by day.

l) Drums

Drums are to be flexible and normally 200 litres capacity set on end and used as delineators. Drums shall be reflectorized to indicate the same colour and shape by night as by day. The

drums are to be predominantly orange, not fluorescent, but a minimum of two white reflectorized strips (100 mm width minimum) per drum is required. Flexible drums may be used as an alternative method to channelize or delineate flow and shall be approximately 1000 mm in height and a minimum of 550 mm in diameter at the base. The markings on the flexible drums shall be horizontal, circumferential alternating black and reflectorized orange strips. The Contractor shall provide ballast to prevent movement of the drums by the wind. Drums shall be spaced in accordance with the approved Traffic Management Plan.

m) Delineator Posts

Delineator posts used to channelize or delineate traffic shall be 1100 mm in height and 100 mm in diameter. The markings consist of two white high intensity reflective bands 75 mm in width.

n) Traffic Cones

Traffic cones, when approved by the Engineer, may be used during daylight hours to guide or channel traffic through a work area. The dimensions of traffic cones should be related to the normal maximum posted speed on the roadway and their height comply with the following minimum requirements:

Table 2.3 Dimension of Traffic Cones based on Speed Limit

Maximum Speed km/h	Minimum Height of cones (mm)
50 or less	450
Greater than 50	700

o) Variable Message Signs

Variable Message Signs are electronic signs that are used to convey additional information about upcoming road work. These signs shall be used only as a supplement to, but not a substitute for, conventional temporary condition signs and devices. Their use in the field shall be limited to installation either prior to, or within the advance warning area.

Variable Message Signs may display either a single fixed message or a number of sequential messages. When programmed to display sequential messages, each message will be referred to as a phase. Each phase shall be visible to approaching motorists for a minimum of three seconds and shall be able to be read a least twice by the approaching motorist. If sequential messages exceed two phases, additional Variable Message Signs may be required. In this situation, the distance between Variable Message Signs shall be given careful consideration, based on the speed limit and the phase cycle, ensuring that the message(s) on each sign can be read twice by approaching motorists.

The following guidelines shall be used to determine the information to be displayed on Variable Message Signs:

- Messages shall consist of upper-case text with a minimum letter height of 30cm.
- The messages shall be displayed in bright yellow or orange, providing a sharp contrast to the sign's black or dark blue/grey background colour.
- Each message shall convey a single, relevant and concise thought.
- Abbreviations shall only be used if they are easily understood.

p) Temporary Conditions Pavement Markings

Temporary Conditions Pavement Markings are usually used in combination with other appropriate warning signs, delineation devices and traffic control devices to mark where the intended vehicle path traffic is expected to manoeuvre through the work zone.

Instances where temporary pavement marking may be used are on a paved diversion to bypass a work site, such as a new bridge construction, or where partial pavement removal or incomplete replacement has occurred in a multiple asphalt overlay process. Where temporary pavement markings are used they should be placed as soon after an original lane marking has been removed to restore the guidance which was in place prior to the construction operations.

In the case of temporary diversions lane markings should be placed prior to diversion opening. Whenever temporary pavement markings are applied any conflicting pavement markings shall be removed or obscured to eliminate possible confusion.

Typical temporary pavement markings consist of temporary marking tape, raised pavement markers and standard traffic paint with glass beads. Yellow markings shall be used where two-way traffic occurs and to delineate opposing traffic. White markings should be used for shoulder edge lines or multiple lanes where traffic flows in the same direction, such as on divided roadways. Short term lane markings may be smaller in size and less frequency of spacing. More temporary markings should be used in areas of curves than on straight sections to highlight road curvature. Temporary markings for long term applications should follow usual line.

q) Speed Humps

These are usually described as a raised hump in the roadway with a parabolic top, extending across the road at right angles to the traffic, with the intention of reducing speeds. They should be administered at a spacing of about 500 feet, clearly visible for 200 feet, and placed at least 200 feet from intersections; inclusive of warning signs.

Other Devices

- **Procedures for Traffic Controllers/Flag Persons**

Under certain conditions during construction or maintenance activities on or along a roadway, the use of a flag person may be required to safely guide motorists through the work site area. The following sections specify the appropriate equipment, signs, and usage of flag persons under such circumstances. The final decision as to the use of flag persons shall be as directed by the user's representative.

The flag person shall wear a high visibility safety jacket or vest, safety boots, approved safety headgear, and hearing and eye protection. They shall be equipped with a flag person "STOP" and "SLOW" reflectorized sign.

Flag persons working as a team shall agree to appropriate signals before commencing their duties. If the flag persons are not visible to one another, two-way radios are necessary to ensure proper communications and directing of traffic. No flag person shall start working unless all

required advance flag person signs are in place. No other construction signs shall be located between the flag person position and the advance flag person signage.

The flag person is not permitted to use a radio, cell phone or any other device which impairs sight, hearing, or attention while working. At no time are flag persons permitted to use flags to control traffic. No flag person shall leave their post unless authorized to do so or replaced by another flag person. As long as traffic cannot flow freely, even at mealtime, the flag person must stay on duty until relieved. Flag persons should stand just outside the lane of traffic at a point from the end of the working area so as to be able to protect personnel and equipment. The distance from the flag person to the work site shall be 10 m for every 10 km/h of normal speed limit.

When the flag person leaves their position at the end of operation on a work zone, the Contractor must remove or cover all applicable advance flag person signage.

- *Standing of Flag persons*

1. Stand outside the lane of traffic.
2. Stand at a distance from the working area as indicated on the sign layout diagram, so as to be able to protect personnel, equipment and motorists.
3. Stand where you can be seen by approaching traffic.

- *Direction of Traffic by Flag persons*

Normal signals to **STOP** traffic are:

- In daylight; the flag person shall face approaching traffic and shall extend his or her free arm horizontally across the approach lane and the flag persons paddle shall be held upright with the **"STOP"** side facing traffic and When an approaching vehicle has almost stopped, the free arm shall be used to indicate the point at which vehicles are required to stop. In darkness; the flag person shall assume the same basic position as for the day signal. He or she shall hold a reflectorized paddle in his or her free hand and flashlight with red signalling baton attached in his or her free hand, the free arm shall be moved slowly back and forth between limits corresponding to the third and sixth hour positions on a clock face, and When an approaching vehicle has almost stopped, the flashlight and baton shall be used to indicate the point at which the vehicle is required to stop;

- Normal signals to **SLOW** traffic are: In daylight; the flag person shall take up a position similar to the one used for the signal to stop with the **"SLOW"** side of the paddle facing approaching traffic; In darkness, The same position and motions shall be assumed as for the night stopping signal except that the **"SLOW"** side of a reflectorized paddle shall face approaching traffic;

- Normal signals to **MOVE** traffic are: In daylight, The flag person shall face across the approaching traffic lane and shall look across his or her shoulder at the traffic he or she is about to move; Traffic shall be advanced by rotating the lower free arm in an oval manner corresponding to the direction in which the vehicle wheels will rotate; If traffic is required to proceed slowly, the flag person shall also extend his or her free arm horizontally towards the approach lane with the **"SLOW"** side of the paddle facing traffic; and If traffic is allowed to proceed at the prevailing speed limit, the flag person shall lower the STOP/SLOW Paddle and

ensure it is hidden from motorists. In darkness, the same signals as for daytime shall apply. A flashlight with red baton attached shall be used in the free hand. The order to proceed or to proceed slowly may be given verbally. The flag persons paddle shall not be used to wave traffic on and shall never be displayed to traffic in other than a static manner. All motions of the flag person's arms, both by day and night, shall be performed precisely and unhurriedly so that the meaning of signals given cannot be misunderstood.

3.0 Traffic Management Monitoring

The Contractor's Environmental and Social Works Inspector shall inspect and monitor traffic movements around the site in conjunction with the personnel who have erected the traffic control measures.

Inspections shall be undertaken as required on the following occasions:

- Before the start of daily work activities on site;
- During the hours of work;
- Closing down at the end of the shift period;
- After hours (this includes, but not limited to night inspections).

Monthly Inspection Forms shall be completed by the person undertaking the inspections and reviewed by the Foreman (See Appendix D for Inspection Form). All variations to the TMP, non-conformances, incidents and accidents shall be recorded. A copy of the completed inspection reports shall be forwarded to CH&PA's Environmental and Social Works Supervisor on a monthly basis.