Environmental and Social Impact Assessment for the Rehabilitation and Operation of Historical Buildings in the inner city of Paramaribo

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Table of Contents

Annexes

Annex I - Overview of the relevant provisions of the Surinamese laws and regulations
Annex II- Baseline reports:
IIA.Baseline Traffic Study report
IIB.Baseline Noise Report
IIC.Water Quality Investigation Field Report
IID.Asbestos Report Ministry of Justice and Police Henck Arronstraat 1
IIE.Asbestos Report Former Department of the Ministry of Justice and Police Grote Combéweg 3
IIF.Asbestos Report Ministry of Justice and Police Mirandastraat 10
IIG.Asbestos Report Ministry of Social Affairs Waterkant

Annex III- All Minutes of meetings:
IIIA. Kick off meeting 15 August 2018
IIIB. Meeting with KDV 23 August 2018
IIIC. Meeting Nimos 23 August 2018
IIID. Meeting Parliament 7 September 2018
IIIE. Meeting with KDV 11 September 2018
IIIF. Meeting with Woei-A-Sioe Architects and Partners 11 September 2018
IIIG. Meeting Public Works 12 September 2018
IIIH. Meeting Ministry of Justice and Police 19 September 2018
III-I. Meeting PIU 28 September 2018
III-J. Meeting Cultural Studies 15 October 2018
IIIK. Meeting BUZA 18 October 2018

Annex IV-

IVA. List of Consulted Stakeholders in the ESIA Phase
IVB. Household Survey Questionnaire
IVC. Excerpt registery CBB CH
IVD. Overview attempts made to interview households

List of Figures

List of Tables

Abbreviations

ABS	General Bureau of Statistics (Algemeen Bureau voor de Statistiek
AdeKUS	Anton de Kom University of Suriname
ADI	Area of direct influence
AII	Area of indirect influence
BUZA	Ministry of Foreign Affairs (Ministerie van Buitenlandse Zaken)
CBB	Central Population Registry (Centraal Bureau voor Burgerzaken)
CBvS	Centrale Bank van Suriname
DC	District Commissioner
DNA	The National Assembly (De Nationale Assemblee)
EBS	Energy Company of Suriname (Energie Bedrijven Suriname)
EHS	Environment, Health and Safety
ESAV	The Indigenous Platform in Unity and Solidarity for Alliance and Progress (Eenheid Solidariteit Alliantie en Vooruitgang)
ESIA	Environmental and Social Impact Assessment
ESMM	Environmental and Social Management Manual
ESMP	Environmental and Social Management Plan
GoS	Government of Suriname
ICOMOS	International Council on Monuments and Sites
IDB	Inter-American Development Bank
IFC	International Finance Cooperation
ILO	International Labor Organization
ISIC	International Standard Industrial Classification of All Economic Activities
KBS	Fire Brigade Suriname (Korps Brandweer Suriname)
Km	Kilometer
M	Meter

MI-GLIS	Management Institute for Land Registration and Land Information System
MINOWC/MESC	Ministry of Education, Science and Culture (Ministerie van Onderwijs, Wetenschap en Cultuur)
MLTDE	Ministry of Labour, Technology Development and Environment
NGO	Non- Governmental Organization
NH	Natural resources, Ministry of (Natuurlijke Hulpbronnen)
NIMOS	National Institute for Environment and Development in Suriname (Nationaal Instituut voor Milieu en Ontwikkeling in Suriname)
OWTC	Public Works, Transportation and Communication, Ministry of (Openbare Werken, Transport en Communicatie)
PAP	Project-Affected Persons
PIU	Project Implementation Unit
PURP	Paramaribo Urban Rehabilitation Program
RFP	Resettlement Policy Framework
RO	Regional Development, Ministry of Regional Development (Ministerie van Regionale Ontwikkeling)
ROGB	Ministry of Spatial Planning, Land and Forest Management (Ministerie van Ruimtelijke Ordening en Grond-en Bosbeheer)
SBHF	Suriname Built Heritage Foundation (Stichting Gebouwd Erfgoed Suriname SGES)
SEP	Stakeholder Engagement Plan
SHATA	Suriname Hospitality And Tourism Association
SWM	Suriname Water Company (Surinaamse Waterleiding Maatschappij)
ToR	Terms of Reference
UNESCO	United Nation Educational, Scientific and Culture Organization
WB	World Bank
WHS	World Heritage Site

Glossary of Terms

Term	**Definition**
Area of Direct Influence	An area in a concentric circle with a 100m radius around the construction site
District	Administrative Unit, comparable with a province. Each district has its own district government with limited powers of decision-making, headed by a District Commissioner (DC).
Domain Land Dutch: *domeingrond*	All land, to which third parties cannot prove land tenure rights is domain land, that is, property of the state.

Grievance Mechanism	This is a process by which Project beneficiaries or Project Affected Persons can raise their concerns and grievances to Project authorities.
Household	A group of persons living together, who share the same cooking and eating facilities, and form a basic socio-economic and decision-making unit. One or more households may occupy a house.
Involuntary resettlement	Resettlement is considered involuntary when affected persons or communities do not have the right to refuse land acquisition or restrictions on land use that result in physical or economic displacement. This occurs in cases of (i) lawful expropriation or temporary or permanent restrictions on land use and (ii) negotiated settlements in which the buyer can resort to expropriation or impose legal restrictions on land use if negotiations with the seller fail.
ISIC	International reference classification of productive activities. Its main purpose is to provide a set of activity categories that can be utilized for the collection and reporting of statistics according to such activities. The ISIC code corresponds with the classification of the activities.
Livelihood	The term 'livelihood' refers to the full range of means that individuals, families, and communities utilize to make a living, such as wage-based income, agriculture, fishing, foraging, other natural resource-based livelihoods, petty trade, and bartering.
Project Affected Persons	A person who has been affected due to loss of land, house, assets, livelihood or a combination of these due to project activities
Ressort	Administrative unit, subsection of a District.
Resettlement Policy Framework	An instrument to be used throughout Project implementation. The RPF sets out the resettlement objectives and principles, organizational arrangements and funding mechanisms for any resettlement, that may be necessary during Project implementation.
Stakeholders	All individuals, groups, organizations, and institutions interested in and potentially affected by a Project or having the ability to influence a Project.
Vulnerable People	Distinct groups of people who might suffer disproportionately from project impacts such as people below the poverty line, the landless, the elderly or disabled, women and children, indigenous peoples, ethnic minorities, resettlement effects.

Executive Summary

This document presents the results and recommendations of the Environmental and Social Impact Assessment (ESIA) for the Rehabilitation of the Historical buildings in the inner city as part of component I of the Paramaribo Urban Rehabilitation Program (PURP).

The appointed Consultant has prepared this ESIA based on the generic environmental assessment and social impact guidelines of the National Institute for Environment and Development in Suriname (NIMOS, 2009) as guidance, as well as international best practice. The analysis and this report were prepared according to the approved Terms of Reference by the Inter-American Development Bank (IDB).

In the Screening Phase of the ESIA, NIMOS determined that the project is a Category B – path 2 project, thus meaning a limited ESIA.

The study was carried out in the period between August and December 2018.

For the compilation of the baseline section, data of previous studies and from existing sources have been used, but in addition fieldwork has been carried out for general orientation, traffic, noise, hydrology and land-use and water quality. Other specialist studies conducted include an asbestos quick scan of the project buildings.

Also extensive public consultation was undertaken, during which local public stakeholders, local government representatives, and district authorities were consulted. A socio-economic survey was conducted in order to collect general information on households, income, the public utilities, and to learn about the opinion and concerns about the project.

The ESIA describes the available information on project designs and operations. The collected data is considered adequate for the analysis of the impact and is covered in this report in nine chapters and four Annexes.

From the impact assessment and the underlying specialist studies, two major and five moderate negative impacts and two moderate positive impacts, are identified. In case the building of the Ministry of Finance at the Mr. J.C. De Mirandastraat #7 is selected for rehabilitation, an additional major negative impact can be added to the list of identified impacts.

All identified significant negative impacts for the selected buildings can be effectively reduced to low impacts with the implementation of the proposed mitigation measures. These are summarized in the table on the next page.

It should be noted that this table needs to be updated once the final selection of buildings has been completed. In case the building of the Ministry of Finance at the Mr. J.C. De Mirandastraat #7 is selected for rehabilitation, the temporary loss of a home should be included as major negative impact.

For the household at the Mr. J.C. De Mirandastraat 7 (Building of Ministry of Finance, not yet selected), there is one specific impact to be addressed in case the building will be selected for rehabilitation. This would cause temporary loss of home which would require the development of a Resettlement Action Plan (RAP).

Environmental and Social project risks and impacts will be managed through an effective Environmental and Social Management Plan (ESMP) which must be implemented as part of normal operations by

incorporating the key components into daily activities, such as including environmental issues in the decision-making process and maintaining complete records. Also, all duties and responsibilities of all involved parties are contained in this plan.

Component	Description	Impact	Residual impact (after proposed mitigation)
Negative impacts			
Fire safety during construction	Fire during construction due to outdated electrical networks	Major	Low
Vandalism	Theft of project goods by homeless	Major	Low
Noise during construction	Nuisance to occupied neighboring buildings	Moderate	Low
Dust during construction		Moderate	Low
Business in the ADI	Decrease/loss of visitors/customers	Moderate	Low
Parking during construction for visitors of the area and surroundings	Reduced and limited parking spaces	Moderate	Low
Traffic during construction	Traffic congestions due to construction activities	Moderate	Low
Positive impacts			
Visual and aesthetics during the operational phase	Physical presence: modern building with historical characteristics	Moderate	Positive
Socio-economy during the operational phase	Physical presence: Promote tourism Conservation historical aspects Public attraction Increase of visitors/customers of business in the ADI	Moderate	Positive

1 Introduction

1.1 Purpose of this document

This document presents the results of the Environmental and Social Impact Assessment (ESIA) for the Rehabilitation and Operation of Historical Buildings in the inner city of Paramaribo, as part of component I of the Paramaribo Urban Rehabilitation Program (PURP). In addition, recommendations are given, which must be carried out prior to the commencement of the rehabilitation works of the historical buildings in the inner city of Paramaribo. This to make sure that appropriate measures to prevent or mitigate/minimize any adverse impacts through all the phases of project implementation are taken into consideration and that an Environmental and Social Management Plan for the historic buildings is in place.

The ESIA has been carried out in compliance with the national regulatory requirements and the Environmental and Social Assessment guidelines of the National Institute for Environment and Development in Suriname (NIMOS, 2005b and 2009) as guidance. Furthermore, relevant standards and guidelines of the Inter-American Development Bank (IDB), the World Bank (WB) Group and the International Finance Corporation (IFC)'s Environmental and Social Review Procedure are taken into account. The assessment and this report were prepared according to the Terms of Reference (ToR) as submitted to NIMOS.

The key regulatory requirements pertaining to the proposed project and the environmental assessment include the following:

- Suriname government policy.
- Suriname legislation, regulations and guidelines.
- International best practice standards, such as the policies and guidelines of the IDB, and the WB Group, including the IFC.
- Relevant international conventions.

1.2 Project background

The Government of Suriname (GoS) and the Inter-American Development Bank (IDB) signed a signed a loan agreement (no. 3905/OC-SU) of twenty million US Dollars (US$20 million) to finance the Paramaribo Urban Rehabilitation Program (PURP).

The main purpose of the PURP is to contribute to the socio-economic revitalization of Paramaribo's historic inner city. This program is implemented by the Ministry of Education, Science and Culture (MESC), through the Suriname Built Heritage Foundation (Stichting Gebouwd Erfgoed Suriname).

The PURP has the following components to be implemented over a 5 years period:

I. Renovation of urban spaces and of key heritage buildings;
II. Improvement in urban mobility (reducing motorized traffic in the World Heritage Site (WHS), and promoting non-motorized transportation),
III. Promotion of economic and residential activities (including the renovation of historic buildings for mixed use housing and commercial uses, as well as tourism planning and identification of soft interventions),
IV. Strengthening the institutional framework for managing the area's development.

The specific objectives of the PURP include:

a) The attraction of new residents and commercial activities;
b) Restoration of value to cultural heritage;
c) Reduction of traffic congestion; and
d) Strengthening of the institutional framework for managing sustainable development.

As part of component I of the Program, some historic buildings in the inner city of Paramaribo will be rehabilitated:

1. Waterkant 32, building of Ministry of Social Affairs,
2. Mr.J.C. Mirandastraat 10, building owned by Ministry of Justice and Police;
3. Henck Arronstraat 1, building of the Ministry of Justice and Police;
4. Grote Combéweg 3, former department of Immigration of the Ministry of Justice and Police.

Some other historic buildings that still need to be selected:

- Waterkant 30, building of Ministry of Social Affairs,
- Mr.J.C. Mirandastraat 5, building of Ministry of Finance,
- Mr.J.C. Mirandastraat 7, building of Ministry of Finance,
- Tamarindelaan 9, Tower building of Ministry of Finance and
- Zeelandiaweg 3, Department of Culture Studies, Ministry of Education, Culture and Communication.

The selected buildings were built back in the 18th century and are currently in dilapidated state. The rehabilitation of the buildings includes maintenance of the original structures that mainly consist of wood, with utmost care to preserve the historic character while modernization is done on the interior. The ground floor will have a multifunctional use (restaurants, gallery, guesthouse) while the second and higher floors will still be used as government offices. The construction period varies per building. Details are provided in Chapter 4.

1.3 The proposed project and ESIA study area

The ESIA study area or the Area of Influence comprises of the several buildings to be rehabilitated as well as the surroundings. The characterization of the Area of Influence is based on the existing environmental and social conditions where the infrastructural works will be carried out. This is distinguished in:

- *An Area of Direct Influence (ADI)* which is considered the physical footprint of the project e.g. the construction site, work staging area and areas affected during the operational phase of the project. For the current project the ADI is defined as the project site and its immediate surroundings based on :
  - Land characteristics and use: for biophysical components such as topography, soil characteristics and terrain stability, impacts are expected to be direct and localized to the project site, therefore the ADI is defined as project site and immediate surrounding (radius of 50-100m)
- *An Area of Indirect Influence (AII)* which is not defined precisely but includes the areas which may experience induced or cumulative changes in combination with the project activities such as traffic flows. For the current project AII is defined based on:
  - Landscape and existing views of the development site and surrounding, air quality, noise levels, traffic and transportation and water: for biophysical components as mentioned above, impacts are expected to be beyond the project site and its immediate surroundings. In general, the historical inner city of Paramaribo may experience indirect nuisance from

the project activities in terms of traffic flows and possible exceeding noise levels, therefore, this area is considered for secondary impact (a radius of 250-500m).

An overview of the ESIA study area with the ADI's of each historical building (radius of 100m) and the AII (radius of 500 m) is presented in Figure below.

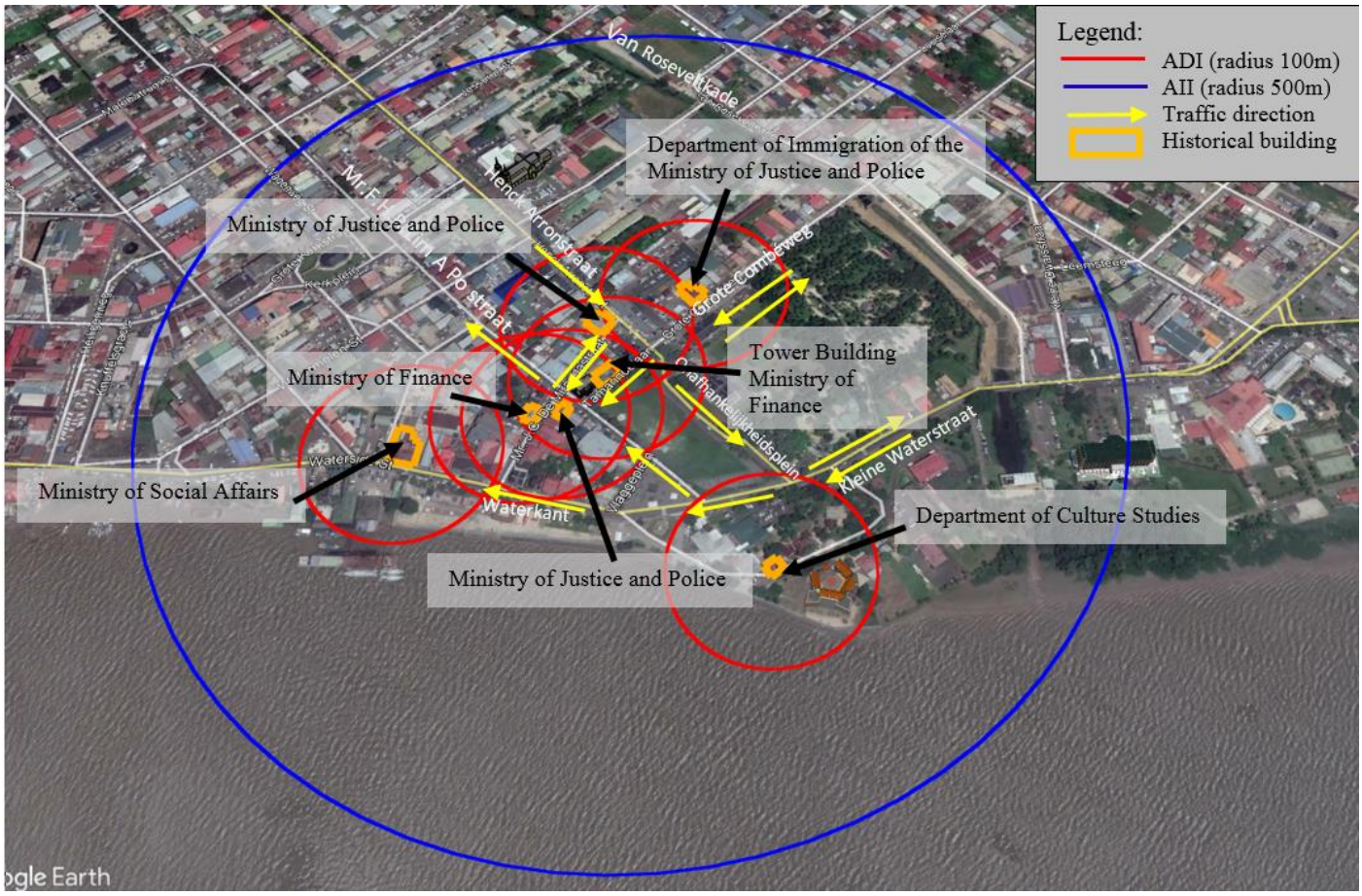

Figure 1: Overview of the ESIA study area with ADI's and AII

The project area for the ESIA comprises the project sites as well as their surroundings. In the Table below the specific surroundings of the projects sites are listed. Maps of the projects sites with their surroundings are presented in *Chapter 4 Section 4.3.2.: Current use of historical buildings and immediate land -use of the surrounding.*

Table 1: Project sites and surroundings

Project site/Historical Building	Surroundings
Department of Immigration of the Ministry of Justice and Police, Grote Combéweg 3	Communication unit of the Ministry of Interior Affairs
	Parking lot
	Office of Canton Court
	Two offices of the Department of Folks Contacts (Volkscontacten)
Ministry of Justice and Police,	Office of the First Lady

Henck Arronstraat1.	The Bishops Residence
	Ministry of Foreign Affairs
Ministry of Justice and Police, Mirandastraat10	'De Kleine Historie' Guesthouse
	Ministry of Justice and Police (Foreigners Affairs)
	FHR School of Management
Ministry of Social Affairs, Waterkant 30 and 32	Division of Ministry of Social Affairs
	Money Exchange
	Fried Chicken Daily
	JIJI Restaurant
	'De Waag' Restaurant
Department of Culture Studies, Zeelandiaweg 3	The Gadri
	Office of Suriname Built Heritage Foundation
Tower Building of Ministry of Finance, Tamarindelaan no.9	Office of the First Lady
	Department of Cabinet of president (Court of Justice- Civil servant law)
	Ministry of Natural Resources
Ministry of Finance, Mirandastraat no. 5-7	FHR School of Management
	Parking lot of the Central Bank of Suriname
	'The Kleine Historie' Guesthouse
	'The West' Newspaper

Note: All neighboring buildings are currently occupied

1.4 Objectives and scope

The objective of this ESIA is to:

- Describe the current environmental and social conditions of the study area
- Inform and obtain contributions from stakeholders, including relevant authorities and local area inhabitants, and address their relevant issues and concerns.
- Verify compliance with the environmental regulations and standards.
- Document and bring into context the bio-physical baseline conditions of the study area.
- Conduct a social baseline study that documents the demographic, socioeconomic, cultural land tenure and use situation in the Area of Influence and the broader impact area.
- Assess in detail the environmental and social impacts that may result from the different phases of the proposed project as well as identified mitigation measures that will allow for minimizing or annihilating negative impacts and maximizing positive project benefits.
- Prepare an Environmental and Social Impact Assessment Report compliant with the Environmental Assessment Guidelines (2009), the guidelines for Social Impact Assessment (NIMOS 2005a) and

- Prepare an Environmental and Social Management Plan (ESMP), to ensure that the project meets both national environmental legislation and the Environmental and Social Safeguards Policy (OP-703) of the IDB.

The IDB has executed the screening of this project and classified it as a Category B project[1]. Although no specific ESIA guidelines for urban construction are available yet in Suriname, the IDB recommended that:

- The ESIA is executed in accordance with the generic environmental assessment and social impact assessment guidelines of the National Institute of Environment and Development in Suriname (NIMOS) and that
- The IDB is provided with the opportunity to review the ToRs to ensure consistency with its requirements

The documents for screening of the project by NIMOS were submitted on the 23rd of August 2018. On September 7th 2018 the result of the screening was received from NIMOS. The ESIA to be conducted for the proposed project was categorized as a Category- B, which means that a limited ESIA is required.

As the second step in the ESIA process a scoping was undertaken. On October 15th 2018, the Draft Scoping Report was submitted to NIMOS. This report was reviewed and approved by NIMOS with reference made to the letter received from NIMOS dating 13th of November 2018.

The Scoping Report includes the ESIA Terms of References for the baseline and impact assessment studies which were used to carry out this ESIA.

1.5 Team of experts

The ESIA has been undertaken by a team of highly motivated experts with ample national and international experience and under conditions similar to the assignment.

Ir. Ravindra PATANDIN	Project Director
Shareen KOENJBIHARIE, BSc.	Team Leader/Environmental Management Engineer
Nancy DEL PRADO, LLM.	Legal Assessment Specialist
Marieke HEEMSKERK, Ph.D.	Social Study Specialist 1
Ayfara HERBONNET, M.Sc.	Social Study Specialist 2
Ir. Dirk NOORDAM	Environmental Specialist
Louise ZUILEN, Ph.D.	Environmental Specialist
S. NARAIN, BSc.	HSE/Jr. Environmental Specialist
M. BLENMAN, BSc.	Sr. Civil Engineer
Mr. E. WEKKER	Asbestos Specialist
Shafida JANMOHAMED BSc.	Project Engineer

[1] Category B operations, according to OP-703 (Environment and Safeguards Compliance Policy) will normally require an environmental and /or social analysis, according to and focusing on the specific issues identified in the screening process, and an Environmental and Social Management Plan.

2 Methodology and Approach

2.1 Introduction

This chapter presents the methodology used to meet the objectives of the assignment as listed in paragraph 1.4. The approach involved an understanding of the project background, the preliminary (basic) design, implementation and commissioning of the project. The current study has been conducted by gathering data through desk study, supplemented by gathering of field data through observations, sampling and testing, stakeholder consultations, interviews and a social survey. The reason for the relatively limited amount of field work is justified by the study being a Category B path 2 project (limited assessment) and the small extent of the project activities. Also there is already a large amount of proper information available for the area from other studies conducted such as the Environmental and Social Assessment for the Paramaribo Urban Revitalization Program Environmental Resources Management, December 2016 and the 'Strategic Urban Mobility Plan for Paramaribo Historic Center' by IDB/IDOM, January 2018. The key tasks during the execution of the assignment are listed in the following paragraphs.

2.2 Baseline study

The baseline study comprises an environmental and social-cultural study of the baseline conditions in the study area. Baseline information was gathered through desktop studies, in-situ observations, survey, photography, public consultation of key members representing the community and discussions with the Project Proponent. The baseline descriptions are based on existing maps, photographs and images, literature reviews, documents, field observations and interviews. Baseline data also have been acquired from records held by government services and others.

2.2.1 Environmental Baseline

The environmental setting described in this section provides baseline conditions from which an assessment of the potential effects of project development was determined. In addition, the baseline environmental information can be used as a benchmark by which future monitoring results will be compared. Specific sources of information per component are listed in
Table 2: Overview of gathered bio-physical information and information **sources**.

Table 2: Overview of gathered bio-physical information and information sources

Component	Information and data sources	Fieldwork activity
Climate	• Records held by Meteorological Survey • Website www.meteosur.sr (MDS 2018) • Background literature and documents (see references)	• None. Expert judgment based on emission sources and prevailing winds (air quality)
Climate change factors	• Background literature and documents (see references)	• None
Air quality	• General background literature and documents (see references)	• 24 hour measurements on Parliament Building at the Henck Arronstraat 2-6 from 22nd of October till the 6th of November 2018 • 24 hour measurements on the CBvS terrain from the 9th of November till the 23rd of November 2018.
Noise	• General background literature and documents (see references)	• Field measurements (daytime) on October 2nd 2018
Geology and soil quality	• Dutch procedures and guidelines (see references)	• Background literature and expert judgement
Water resources including flooding risks and water quality	• Background literature and documents (see references)	• Surface water quality measurements (in situ measurements) on October 2nd, 2018
Traffic flows and infrastructure, road network and services	• Background literature and documents (Strategic Urban Mobility Plan for Paramaribo Historic Center' by IDB/IDOM, January 2018)	• Traffic counts (day) October 2nd, 2018
Hydrology and Drainage	• Background literature and documents • Interview deputy-director Civil Works of the Ministry of Public works • Interview fire department • Specifications Renovation and redivision of the building of the Ministry of Justice and Police, Head Department of Immigration Affairs Grote Combéweg 3, Paramaribo, Woei-A-Sioe Architects and Partners, no. WAS/SU.13.01 June 2018	• Survey on September 12th, 13th and 25th ,2018 • Meetings with KDV Architects on the 23rd of August 2018 and September 11th 2018 and with Woei-A-Sioe Architects and Partners N.V. on September 11th 2018 to discuss new drainage plan

	• Specification Renovation and redivision of the building of Ministry of Justice and Police, Henck Arronstraat 1, Paramaribo, Woei-A-Sioe Architects and Partners, no. WAS/SU.13.03 June 2018 • Project Specifications KDV 2015-4502 D001-a for the restoration Mirandastraat 10 Ministry of Justice and Police, June 14th 2018 • Project Specifications KDV 2017-12 D001-a for the restoration Waterkant 32 Ministry of Social Affairs(SOZAVO), April 30th 2018	
Asbestos	- General background literature and documents (see references)	Inspection by asbestos specialist on: • (day) September 20th 2018 of Department of Immigration of the Ministry of Justice and Police Grote Combéweg 3; • (day) September 21st 2018 of Ministry of Justice and Police Henck Arronsraat 1; • (day) September 24th 2018 of Ministry of Justice and Police Mirandastraat 10 and, • (day) September 28th 2018 of Ministry Social Affairs Waterkant 32
Parking	• General background literature and documents (see references • Specifications Renovation and redivision of the building of the Ministry of Justice and Police, Head Department of Immigration Affairs Grote Combéweg 3, Paramaribo, Woei-A-Sioe Architects and Partners, no. WAS/SU.13.01 June 2018 • Specification Renovation and redivision of the building of Ministry of Justice and Police, Henck Arronstraat 1, Paramaribo, Woei-A-Sioe Architects and Partners, no. WAS/SU.13.03 June 2018 • Project Specifications KDV 2015-4502 D001-a for the restoration Mirandastraat 10 Ministry of Justice and Police, June 14th 2018 • Project Specifications KDV 2017-12 D001-a for the restoration Waterkant 32 Ministry of Social	• Field survey study area on September 12th 2018 • Meetings with KDV Architects on the 23rd of August 2018 and September 11th 2018 • Meeting with Woei-A-Sioe Architects and Partners N.V. on September 11th 2018

	Affairs(SOZAVO), April 30th 2018	
Energy and water use in the operational phase	• General background literature and documents (see references) • Specifications Renovation and redivision of the building of the Ministry of Justice and Police, Head Department of Immigration Affairs Grote Combéweg 3, Paramaribo, Woei-A-Sioe Architects and Partners, no. WAS/SU.13.01 June 2018 • Specification Renovation and redivision of the building of Ministry of Justice and Police, Henck Arronstraat 1, Paramaribo, Woei-A-Sioe Architects and Partners, no. WAS/SU.13.03 June 2018 • Project Specifications KDV 2015-4502 D001-a for the restoration Mirandastraat 10 Ministry of Justice and Police, June 14th 2018 • Project Specifications KDV 2017-12 D001-a for the restoration Waterkant 32 Ministry of Social Affairs(SOZAVO), April30th 2018	• Meetings with KDV Architects on the 23rd of August 2018 and September 11th 2018 • Meeting with Woei-A-Sioe Architects and Partners N.V. on September 11th 2018
Health and safety aspects	• General background literature and documents (see references) • Specifications Renovation and redivision of the building of the Ministry of Justice and Police, Head Department of Immigration Affairs Grote Combéweg 3, Paramaribo, Woei-A-Sioe Architects and Partners, no. WAS/SU.13.01 June 2018 • Specification Renovation and redivision of the building of Ministry of Justice and Police, Henck Arronstraat 1, Paramaribo, Woei-A-Sioe Architects and Partners, no. WAS/SU.13.03 June 2018 • Project Specifications KDV 2015-4502 D001-a for the restoration Mirandastraat 10 Ministry of Justice and Police, June 14th 2018 • Project Specifications KDV 2017-12 D001-a for the restoration Waterkant 32 Ministry of Social Affairs(SOZAVO), April30th 2018 • Fire safety	• Meetings with KDV Architects on the 23rd of August 2018 and September 11th 2018 • Meeting with Woei-A-Sioe Architects and Partners N.V. on September 11th 2018 • Meeting with the Fire Department, 4th of October 2018. • Telephone conversation with Fire Department Prevention, 5th of December

Waste management	• General background literature and documents (see references) • Specifications Renovation and redivision of the building of the Ministry of Justice and Police, Head Department of Immigration Affairs Grote Combéweg 3, Paramaribo, Woei-A-Sioe Architects and Partners, no. WAS/SU.13.01 June 2018 • Specification Renovation and redivision of the building of Ministry of Justice and Police, Henck Arronstraat 1, Paramaribo, Woei-A-Sioe Architects and Partners, no. WAS/SU.13.03 June 2018 • Project Specifications KDV 2015-4502 D001-a for the restoration Mirandastraat 10 Ministry of Justice and Police, June 14th 2018 • Project Specifications KDV 2017-12 D001-a for the restoration Waterkant 32 Ministry of Social Affairs(SOZAVO), April30th 2018	• Meetings with KDV Architects on the 23rd of August 2018 and September 11th 2018 • Meeting with Woei-A-Sioe Architects and Partners N.V. on September 11th 2018

After the fieldworks the data processing was done in the period from October 4th till December 5th 2018. The findings from the processed data have been compiled into this document.

2.2.2 Social Baseline

The social setting described in this section provides baseline conditions from which an assessment of the potential effects of project development was determined.

Review of existing data
The assessment started with a review of existing secondary data. Consulted secondary data included books, consultancy reports, data from the Suriname General Bureau of Statistics (*Algemeen Bureau voor de Statistiek* – ABS), data from websites from international organizations and online news media.

According to the United Nations Educational, Scientific and Cultural Organization (UNESCO, 2017) the historical inner city of Paramaribo:

- ✓ *is an exceptional example of the gradual fusion of European architecture and construction techniques with indigenous South American materials and crafts to create a new architectural idiom;*
- ✓ *is a unique example of the contact between the European culture of the Netherlands and the indigenous cultures and environment of South America in the years of intensive colonization of this region in the 16th and 17th centuries.*

Therefore, the UNESCO state conservation report 2017 was reviewed as well.

Stakeholder interviews
Information gaps and issues that remained unclear after literature review were completed and clarified through interviews with key experts and other stakeholders. These interviews also served to verify, modify and correct existing written information. Moreover, stakeholder interviews served to document stakeholder perceptions on the potential positive and negatives effects of the PURP Historic Buildings Project, and to more fully explore potential challenges and opportunities to Project Affected Persons (PAPs).

Consulted experts and key knowledge persons included relevant representatives from government, organizations and civil society. Government representatives included the District Commissioner (DC) of Paramaribo North-East, the Regional Commander of Police for Paramaribo and Fire Brigade Suriname (Korps Brandweer Suriname, KBS). Meetings also were held with non-governmental organizations such as the Foundation Build Heritage Suriname and the Suriname Hospitality and Tourism Association (SHATA). A full list of consulted individuals is presented in Annex IVA.

Household interviews
Based on observations and interviews, ten households were identified in the ADI, of which four were part of an apartment complex managed by VSH United. The manager of the VSH apartments requested that these households were not contacted to be interviewed, although several attempts have been made (also see Annex IVD). She estimated that eight persons live in these apartments (pers. com. October 26th, 2018). Interviews were held with all remaining households. In-depth interviews were conducted with the household situated at Grote Combéweg and with the households living at Mr. J.C. De Mirandastraat, because these households will likely experience most impact. The Household Survey Questionnaire is attached as Annex IVB.

2.3 Impact assessment

The impact assessment is based upon qualitative or quantitative assessment of the following attributes:

- Magnitude
- Geographical scale
- Duration
- Probability of occurrence

The resulting impact will be indicated by their significance class, which classes are defined as shown in Table 3: Classes of impact significance.

Table 3: Classes of impact significance

< Impact significance >
Major (significant) effect: effect expected to be permanent or continuous and non-reversible on a national scale and/or have international significance.
Moderate (significant) effect: long-term or continuous effect, but it is reversible and/or it has regional significance.
Minor (not significant) effect: effect confined to the local area and/or of short duration, and it is reversible.
Negligible (not significant) effect: effect not detectable.
Unknown effect: insufficient data available to assess the significance of the effect.

In addition, impacts have been classified as:

- Positive: indicating whether the impact will have a positive (beneficial) effect; or
- Negative: indicating whether the impact will have a negative (adverse) effect on the environment, including affected people.

The degree of detail has enabled the determination of required mitigation and possible enhancement measures, respectively to prevent or reduce significant negative impacts and to promote any positive impacts already in the planning phase. The implementation of mitigation measures will reduce negative environmental impacts to an acceptable level as much as possible.
After implementation of mitigation/enhancement measures the significance of the impacts has again been determined.
The overall impact assessment will be presented summarized using a table:

Project Activity	**Resources Affected**	**Impact Description**	**Likelihood**	**Characteristics and Consequence**	**Impact Significance**	**Mitigation Measures**	**Residual Impact**

The methodology is presented in the Scoping Report to which is referred.

3 Legal and Institutional Framework

3.1 Introduction

This chapter provides an overview of the policies, legislation and institutions that form the enabling environment of the project.
The Development Plan (current version 2017-2021) forms the overarching planning and policy document for the development of the country in the widest sense. The Development Plan emphasizes that a responsible environmental policy will be implemented. This policy will consider all the risks that may arise from, amongst others, climatic changes and risks resulting from improper use of the soil and nature.

Aspects that will receive particular attention are:
a. Sea level rise;
b. Risk of disasters caused by man or nature;
c. Chemicals management;
d. Waste management and emission of harmful substances;
e. Renewable energy;
f. Atmosphere protection;
g. Sustainable water, nature, land and forest management;

As it relates to cultural heritage, the Development Plan underlines that the cultural policy must be developed in such a way that the preservation and development of local cultures is part of the planned social progress. A precondition for a successful cultural policy is the adjustment of outdated laws and regulations, or the acceptance of missing ones. Some of the areas that this concerns are intellectual property, and the management and protection of the cultural heritage including buildings.

3.2 Legal framework

Suriname's legislation is exercised through a suite of different legislative instruments, including Laws or Acts of Parliament *(Wet, also called Landsverordening prior to 1975)*, Decrees[2] (*Decreten*), and regulations which are in the form of State Orders (*Staatsbesluiten*), Presidential Orders *(Presidentiële besluiten*), Presidential Resolutions (*Presidentiële Resoluties*) and Ministerial Orders (*Ministeriële Beschikkingen*).
The legal basis for environmental protection in the Country is provided by the Constitution (1987, last amended in 1992). It is stated that one of the social objectives of the State is directed towards *"The creation and promotion of conditions, necessary for the protection of nature and for conservation of the ecological balance" (article 6g)*.
Despite this constitutional provision, Suriname's environmental regulatory regime has not fully evolved. The current legislation stems from the Colonial period and is more focused on nature conservation rather than pollution control. The legislation includes, amongst others, the Nature Conservation Act 1954, Game law 1954 and Fisheries Act 1961. After independence in 1975, several new laws were promulgated with the aim to regulate exploitation of the natural resources of the country and not environmental management in particulars'. Examples are the Mining Act of 1986 and the Forestry Act 1992. In general, the legislation regarding environmental and natural resource management is fragmented, dispersed between different pieces of legislation.

[2] Decrees date from the Period of Military Ruling (1980-1986) and have the same status as a law.

Responsibility for the management of the environment and natural resources resides within different government institutions whereas there is a lack of coordination and enforcement.

In this light, in 1998, the National Institute for Environment and Development in Suriname (NIMOS) was established with a mission to initiate the development of a national legal and institutional framework for environmental policy and management in the interest of sustainable development in the Republic of Suriname. It was in the year 2002 when NIMOS started the process to develop an Environmental Framework Act for Suriname.

The legal and regulatory framework for environmental impact assessments in Suriname is governed by NIMOS using the generic Environmental Assessment Guidelines (2009). In October 2018, the Draft Environmental Management Act was submitted to Parliament for discussion. The Environmental Management Act will provide the legal base for the implementation of the Environmental Assessment Guidelines.

NIMOS is currently in the phase of formulating regulations for pollution control and Environmental Impact Assessment. The generic EA guidelines (NIMOS 2005b and 2009) as well as social impact assessment guidelines (NIMOS 2005a) will be followed for the current study.

In the context of conservation and protection of its natural and cultural heritage the Constitution of Suriname (1987, last amended in 1992) states under article 47 the following: *"The State preserves and protects the cultural heritage of Suriname, stimulates its preservation and promotes the practice of science and technology within the framework of the national development goals"*.

Relevant Legislation Related to the project

A. Environment

The Environmental issues to be dealt with in the current project are regulated under:

i) The **Building Act** and the **State Order on Building**. This legislation provides for the control of Construction of Buildings through a permitting system. The regulations outline the technical requirements for building structures and specific rules concerning the setting up of latrines and septic tanks and the discharge of wastewater. The Ministry of Public Works, Transport and Communication is responsible for enforcement of this Act.

ii) The **Penal Act** and **Police Criminal Act** which are both criminal acts penalize water pollution and littering. The Ministry of Justice and Police is responsible for its enforcement.

iii) The **Nuisance Act** aims to prevent the cause of danger, damage or hindrance caused by undertakings (enterprises) to the outside-fence surrounding environment. The District's commissioner is responsible for enforcement.

B. Occupational Health and Safety

The Occupational Health and Safety legislation applicable to the project are:

i) The **Safety Act** 1947 (G.B. 1947 no. 142 as lastly amended by S.B. 1980 no. 116) which is a framework act on safety and hygiene in enterprises. Detailed rules are laid down in subsidiary legislation. At present, there are 9 Safety regulations pursuant to the Safety Act. The Act and the regulations aim to decrease the chances of employment injuries and occupational diseases. They

provide specific rules regarding safety on the work floor. Enforcement of the aforementioned laws and regulation is a responsibility of the Ministry of Labor. Suriname is a member of the International Labor Organization (ILO) and has ratified several conventions related to workmen's compensation, safety standards for construction, and labor inspections[3].

ii) The **Building State Order** specifically provides occupational health and safety rules for workers in the construction sector.

iii) The **Accidents Act** regulates that all employers are obliged to insure employees against accidents related to the work.

iv) The **Act on Driving** as well as the **State Order on Driving** provides rules for participation in the vehicular traffic. This legislation provides, amongst others, for rules regarding loading and unloading of cargo on public roads, transportation of large cargo and it prohibits nuisance caused by motor vehicles.

C. Cultural heritage

The legislation related to cultural heritage falls under the following acts and regulations:

i) The **Building Act,** No. 30 (1972) (last amended SB 2002, No.72) and the **State Order on Building**. This legislation provides for the control of Construction of Buildings through a permitting system. The regulations outline the technical requirements for building structures and specific rules concerning the setting up of latrines and septic tanks and the discharge of wastewater. It is prohibited to build if the given requirements aren't met with those of the Building Act (art.1). In the Act "building" means the placing, the complete or partial establishment, renewal, change, or expansion of buildings or other structures in the broadest sense of the word, including hydraulic constructions (art.1-3). As it regards monuments, a building permit may be refused if the building plan relates to a monument within the meaning of Article 3 of the Monuments Act and this isn't in compliance with the granted permit by the Minister responsible for cultural affairs (art.4-1b). To promote a harmonious development in urban and village areas with its own aesthetic character, the Director can make special demands on the building plans within those zones. The Director allows himself to assess these requirements by an expert committee, whose duties and powers will be arranged by State Order (art.4-2). The Building Act also states that if a building or structure, either by old age is in a dilapidated state, or from other reasons endangers the safety or health of users or others, the owner of that building is obliged to comply with a notice issued to him by the Director within the specified period to repair, renovate or demolish the dilapidated building, or to take measures in the interest of safety and health, which is deemed necessary by the Director in respect of that building or structure (art.6-1).The Ministry of Public Works, Transport and Communication is responsible for enforcement of this Act.

ii) The **State Order for Monuments Register,** No. 41 (2000), sets out the procedure upon the registration of immovable property and parts thereof which have been designated by the Minister as objects of monument conservation. Further regulations concerning the design and management of the monument register must be established, in order to make registration as intended possible.

iii) The **State Order for designation of Historic Town,** No. 74 (2001). In this State Order provisions are made upon the establishment of the Construction committee and its tasks. Further on the boundaries of the historic city center are indicated as well as the designation of two buffer zones adjacent to the historic city center.

iv) The **Monuments Act,** No. 72 (2002), sets out provisions concerning the preservation of monuments and town and village views. Article 2 elaborates on the establishment of the Monument Conservation Commission and its tasks. Article 3 sets out the procedure of designation and alteration upon monuments. Provisions are set out for public monument register (art.5). Article 6 offers the opportunity to object to the designation as a monument or to a decision to remove a monument from the monument list. It is prohibited to demolish a monument, or to change the appearance or the control structure without obtaining a license from the Minister (art.7). Before the Minister takes the decision regarding a permit to for demolishing, restorations or movement of monuments advice is requested from the Commission Monuments care and / or the Archaeological Service (art.7-3). Article 8 provides for the rules associated with the licensing system, while indicating that a register must be kept of all permits. Articles 9, 10 and 11 outline provisions regarding restoration and preservation of the monuments. Furthermore, provisions are made regarding the designation of 'city and village view', registration in the public register and rules that relate to new construction, demolition, alterations or renovations to buildings etc. (art 13, 14, 15, 16). Articles 17 to 22 elaborate on the provisions set out for underground objects that can be qualified as a monument. Articles 23 to 28 emphasizes on the coercive measures and penal provisions. Article 30 of the Act elaborates on the amendment to the Building Act and the Urban Planning Act. As it regards art.4 of the Building Act, a permit may be refused:

a. if the building plan or the papers or the documents do not comply with the requirements set out in art.1 of the State Order or referred to in art.3 of the Building Act.
b. if the building plan relates to a monument within the meaning of Article 3 of the Monuments Act and this is not in accordance with the permit granted by the Minister responsible for cultural affairs.

In the case archeological sites are found during the project, the provisions in the Monuments Act regarding archeological sites are applicable. Article 20.1 stipulates that monuments found in excavations and on which no one can prove the right of ownership are owned by the state. 2. The owner of the land in which the monuments have been dug up is required to transfer the found monuments to the State and is entitled to a reimbursement amounting to half the value of those monuments. 3. Monuments found in an investigation…may be transferred to a place suitable for their custody on the instructions of the Minister of Education.

Article 21. States that the finder, within thirty working days after the discovery must indicate the exact location, time, monument and particulars of the discovery to the District Commissioner (DC) of the district in which the discovery has been made who shall immediately notify the Minister.

v) The Ministerial Order on Plans for the Historic Downtown, No. 34 (2003)
This Order provides for special requirements for building plans for the historic inner city and adjacent zone. Since renovations of the historic inner city are highly susceptible to changes which can result in the loss of the cultural historical character rules / requirements for the construction plans are established. These requirements are also to maintain the cultural historic quality.

Various pieces of legislation related to Environment, Health and Safety and Cultural heritage are required to be complied with during the implementation of the project. Appendix 1 provides an overview of these legal instruments. This list does not intend to be definitive or exhaustive, but serves to highlight the key obligations only.

3.3 International Best Practice Standards

Where national legislation, standards or guidelines are lacking or where international standards are more stringent, international standards like the IFC World Bank standards are applied where applicable. As the project is financed by the IDB, the IDB Environmental and Social Safeguard Policies and Directives will be used to guide the project.

The World Bank Sourcebook for Environmental Assessment should be used as a guidance document for this study. The Sourcebook is a reference document that provides practical guidance for identifying and addressing negative environmental impacts of development projects. The Sourcebook aims to collect all World Bank policies, procedures, guidelines, precedents and best practice that reside in different World Bank publications into a single source. The document is continually updated and covers a wide range of subjects.

It is recommended that for the current project, the *IFC[4] Environmental, Health and Safety Guidelines developed for Construction and Decommissioning* are used in the absence of national legislation. The hazards and risks associated with the project will be held against this standard. Where Suriname's legislation is absent or differs from the levels and measures presented in the EHS Guidelines, it is recommended to use the most stringent standard or guideline.

The EHS Guidelines for Construction and Decommissioning include information relevant to the management of EHS issues. The environmental issues associated with construction and decommission projects include Noise and Vibration, Soil Erosion, Air Quality, Solid Waste, Hazardous Materials, Wastewater Discharges and contaminated land. The associated occupational Health and safety issues include over-exertion, and ergonomic injuries and illnesses, slips and falls, Work in Heights, Struck by Objects, moving machinery, dust, Confined Spaces and Excavations. In addition, the guideline recommends to implement risk management strategies to protect the community from physical, chemical, or other hazards associated with sites under construction and decommissioning. Traffic Safety and disease are included as associated issues.
The EHS Guideline recommends a number prevention and control measures which, if applicable, can be included in the Environmental Management and Monitoring Plan which is part of current study.
The IFC Performance Standards will also guide the project where relevant and feasible. For current project, the following standards are applicable:

- *PS 1 Social and Environmental Assessment and Management Systems*

This standard requires the identification and assessment of all social and environmental impacts and risks in a project's area of influence. It aims to avoid, or where avoidance is not possible, minimize adverse social and environmental impacts and to ensure that affected communities are appropriately engaged. The Standard promotes the use of management systems to improve social and environmental performance.

- *PS 2 Labor and Working Conditions*

This standard aims to establish, maintain and improve worker-management relationships through fair treatment of workers and compliance with national labor and employment laws. It aims to prevent

[4] On the 2th of September 2011 Suriname became a member of the IFC. Suriname is the 14th Caribbean country who joins IFC.

unacceptable forms of labor, e.g. child and forced labor and promotes safe and healthy working conditions. The Standard addresses issues such as human resources policy, non-discrimination and equal opportunity, retrenchment, occupational health and safety, contract labor, etc.

- *PS 3 Pollution Prevention and Abatement*

Application of the principles of the World Bank's Pollution Prevention and Abatement Handbook at Policy level is addressed by this standard which aims to avoid or minimize pollution from project activities. Key issues addressed include resource conservation and Energy Efficiency, hazardous materials, waste management, emergency preparedness and Response, ambient and cumulative considerations, greenhouse gas emissions, pesticide use and management.

- *PS 4 Community Health, Safety and Security*

The objective of this standard is to minimize and manage health and safety risks to local communities from project related activities. Issues addressed entail infrastructure and equipment safety, hazardous material safety and environmental health. The standard is also to ensure that the safeguarding of project related personnel and property is carried out in a legitimate manner that avoids or minimizes risks to the community's safety and security.

- *PS 5 Land Acquisition and Involuntary Resettlement*

The objective of this standard is to avoid involuntary resettlement wherever possible and to minimize its impact on those displaced through mitigation measures such as fair compensation and improvements to and living conditions. Active community engagement throughout the process is essential.

- *PS 8 Cultural Heritage*

The objective of this standard is to guide companies in protecting cultural heritage from adverse impacts of project activities and supporting its preservation. It also promotes the equitable sharing of benefits from the use of cultural heritage.

The IDB Board of Directors has approved a set of standards (General Operational Policies and Sector Policies that include social and environmental safeguards applicable to all Bank-Financed Projects and that make sustainability an integral part of the Bank's work.
These standards must be observed by all Bank personnel and serve as a guide for the identification of potential social and environmental impacts of Bank-Financed Projects.
These policies also establish the standards for informing and consulting with the region's population that Bank-Financed Projects must meet.

With regard to the IDB Environmental and Social Safeguard Policies and Directives OP-703, the following aspects are of relevance from an environmental standpoint. The IDB has a threefold strategy for addressing environmental concerns: These are:

1. to enhance long-term development benefits to its member countries by integrating environmental sustainability outcomes in all Bank operations and activities and strengthening environmental management capacities in its borrowing member countries;
2. to ensure that all Bank operations and activities are environmentally sustainable as defined in its Policy, and
3. to foster corporate environmental responsibility within the Bank.

The Bank seeks to act to achieve these specific objectives by adopting measures to mainstream the environment into overall economic and social development, and to safeguard the environment in all Bank activities. Additionally, the Bank's Environmental and Safeguards Compliance Policy (OP-703 GN-2208) states that "the Bank will proactively support borrowing countries and clients in identifying and financing operations designed specifically to: (i) enhance environmental governance, policy development and institutional capacity building; (ii) reverse environmental deterioration; and (iii) promote the conservation and sustainable use of natural resources and ecological services."

With respect to the policies mandate to safeguard the project its finances, the Bank categorizes projects according to the potential environmental and social impacts as either: (i) Category A – Operations that are likely to cause significant negative environmental and associated social impacts, or have profound implications affecting natural resources, (ii) Category B – Operations that are likely to cause mostly local and short-term negative environmental and associated social impacts and for which effective mitigation measures are readily available, and (iii) Category C – Operations that are likely to cause minimal or no negative environmental and associated social impacts (Directive B.3 of OP-703)

According to OP-703, the project has been categorized". The historical buildings are located in the historical inner city of Paramaribo and are mainly surrounded by government buildings. The ESIA study area is a very active and busy area were schools, churches, utility companies, monuments, monumental and other historical buildings; recreational spaces and restaurants are located. It is expected that the rehabilitation activity is likely to cause mainly localized and short-term environmental and social impacts for which effective, standard, and easily implementable mitigation measures exist.

During the operation phase, the facility will generate waste and create traffic congestions, which are likely the most sensitive environmental and social issues of concern for this Project.

As current project may result in temporarily resettlement of residents/occupants, the Bank's Operation Policy 710 on involuntary resettlement should be applied.

The objective of the policy is to minimize the disruption of the livelihood of people living in the project's area of influence, by avoiding or minimizing the need for physical displacement, ensuring that when people must be displaced, they are treated equitably and, where feasible, can share in the benefits of the project that requires their resettlement.

In order to achieve the overall objectives of this policy, operations which may require resettlement will be evaluated and prepared according to two fundamental principles, namely:
i) Every effort will be made to avoid or minimize the need for involuntary resettlement.
ii) When displacement is unavoidable, a resettlement plan must be prepared to ensure that the affected people receive fair and adequate compensation and rehabilitation.

3.4 Relevant International Conventions

Suriname is signatory to several international agreements and conventions related environmental management as well as to Occupational Health and Safety conventions. As the selected sites are mostly situated in the UNESCO Cultural Heritage Site (in the designated conservation zone), the Conventions related to cultural heritage will be included. These conventions provide the direction for the national policy to be implemented by the Government. Table 4: Conventions relevant to the Project**.** provides a listing of the Conventions which are considered relevant to the current project.

Table 4: Conventions relevant to the Project.

Environment	
Title of the Convention	Purpose
United Nations Framework Convention on Climate Change 1994	To stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Under the Convention, both developed and developing countries agree to take measures to limit emissions and promote adaptation to future climate change impacts; submit information on their national climate change programs and inventories; promote technology transfer; cooperate on scientific and technical research; and promote public awareness, education, and training.
Kyoto Protocol 1997	The Kyoto Protocol is an international agreement linked to the United Nations Framework Convention on Climate Change, which commits its Parties by setting internationally binding emission reduction targets. Recognizing that developed countries are principally responsible for the current high levels of GHG emissions in the atmosphere as a result of more than 150 years of industrial activity, the Protocol places a heavier burden on developed nations under the principle of "common but differentiated responsibilities."
Vienna Convention for the Protection of the Ozone Layer 1985	To protect human health and the environment against adverse effects resulting or likely to result from human activities which modify or are likely to modify the ozone layer. To promote international cooperation in the legal, scientific and technical fields, and encourage the exchange of information
Montreal Protocol on Substances that deplete the Ozone Layer 1989	To protect the Ozone layer by phasing out the production of numerous substances that are responsible for Ozone depletion
Stockholm Convention on Persistent Organic Pollutants 2001	To protect human health and the environment from POPs. POP is the abbreviation for ' Persistent Organic Pollutants ', or a collective name for various, often toxic chemical compounds. With persistent is meant not or poorly biodegradable. These POPs are distributed worldwide and accumulate in the fat of living organisms and are toxic to humans and animals. By implementing this treaty, countries will take measures to eliminate or reduce the spread of POPs in the environment.
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal 1989	The treaty aims to protect the human health and the environment through minimization of the generation of hazardous waste and other materials where possible. The Convention also aims to further remove the waste as close to the source of origin or process to minimize the amount of hazardous substances and their danger and to limit their movement across international borders.
Labor, Health and Safety	
Constitution of the International Labor Organization	Promotes opportunities for women and men to obtain decent and productive work, in conditions of freedom, equity, security and human dignity
ILO Code of Practice	Promotes Safety and Health in Ports
Constitution of the Pan American Health Organization	To improve health and living standards of the Countries of the Americas
Constitution of the World Health Organization	The attainment of People of highest possible level of health
Cultural Heritage	
Convention Concerning the Protection of the World Cultural and Natural Heritage 1972	The World Heritage Convention aims to promote cooperation among nations to protect heritage around the world that is of such outstanding universal value that its conservation is important for current and future generations.

With regards to conventions being in force into the national legal system, it can be stated that Suriname has a mixed system; both monistic and dualistic. According to the Constitution, treaty provisions that may be directly binding on citizens shall become effective upon its promulgation (monistic). Legal regulations in force in the Republic of Suriname shall not apply if such application should be incompatible with provisions of international agreements that are directly binding on citizens and that were concluded either before or after the enactment of the regulations. The latter mostly regard human rights treaties. In the case where the international treaties provide for instruction norms towards the Government, they must be transformed into national legislation to be applicable (Dualistic). In general, environmental treaties provide instruction norms towards the Government. These Conventions usually require that legal and administrative matters are being implemented by governments.

3.5 Institutional framework

Several government departments and agencies play a role in environmental management in Suriname. This results in fragmentation and insufficient coordination. Within this section only the main entities are discussed and their relevance to environmental, occupational health and safety is highlighted.

A National Council for the Environment (NMR) was established in 1997 as an advisory body to the government and consists of five members appointed by the president and five members representing the trade and industry, unions, Amerindian and Maroon communities and consumer organizations. Currently, the Council is inactive[5]. The National Institute for Environment and Development in Suriname (NIMOS) was created in 1998 to support the NMR in implementation and research and to create national framework for environmental policy and management. NIMOS's current activities include review of environmental and social impact assessments of proposed projects, environmental monitoring and enforcement of environmental mitigation plans, and education and outreach.

An Environment Section was later created in the Ministry of Labor, Technological Development and Environment (ATM), which was converted to a Directorate in 2011. NIMOS worked under this Directorate. In 2013, the Directorate was removed from the Ministry and a National Environmental Policy Office was created in the Cabinet of the President, which also was to oversee NIMOS. The Policy Office, known as 'Coordination Environment' did not become operational until late 2015. The Coordination Environment Office is responsible for formulating and coordinating environmental policy and environmental legislation and serves as the environmental focal point, representing the country in the various environmental conventions it is party to.
Other environmental management activities and policies are under various ministries. The Ministry of Physical Planning, Land and Forest Management is responsible for the issuance of domain land, physical planning, nature conservation and forest management.

The Ministry of Natural Resources is responsible for water resources policy, drinking water supply, energy resources, and mineral resources. The Geological Mining Division (*Geologische Mijnbouwkundige Dienst)* is responsible for monitoring of mining licenses.

The Ministry of Public Works, Transport and Communication is responsible for policy, planning and development of general architectural structure, and other civil engineering infrastructure, flood control and drainage, surface water and urban drainage, hydrological and meteorological monitoring, and manages sewage treatment, technical provisions for traffic and public transport as well as management of all harbors.

[5] Personal Communication with Legal Officer NIMOS, Gina Griffith, dd 15 October 2018.

In the environmental arena, the Ministry of Health[6] is responsible for public health in the broadest sense, for the monitoring of the protection of public health in particular, for health information and education, and for regulating medical waste management.

The Ministry of Agriculture, Animal Husbandry and Fisheries is responsible for pesticide management, including imports, distribution, storage and use.

In the arena of Occupational Health and Safety, the Ministry of Labor plays a major role. The Labor Inspection is responsible for the monitoring of the legislation on Occupational Health and Safety

As it relates to the management of cultural heritage and heritage administration in Suriname, this is solely a government affair. The primary heritage authority in Suriname is the Ministry of Education. The Ministry is responsible for the promotion, practice and development of art and culture and for museums, archeology and monuments. Based on the Monuments Act 2002, this Ministry may issue permits for demolishing, restorations, movement of monuments, create and curate lists of protected monuments, prohibit demolition, compel restoration of historic buildings, and prosecute offenders. Before the Minister takes the decision regarding a permit for demolishing, restorations or movement of monuments advice is requested from the Commission Monuments care and / or the Archaeological Service.

The Ministry of Education is assisted in heritage administration and protection by the Commission for Monuments care, which advises on the implementation of the Monuments Act as well as reports to the Minister regarding the state of the Monuments. The Commission further executes activities in the area of monuments care assigned by the minister or by law. In case of archeological monuments, advice is being requested from the Archeological Service.

The Ministry of Public Works, Communication and Transport is responsible for building permits in general and specifically when it regards plans and permits for building in the historic downtown and historic towns and villages. The Ministry is then advised by the Building Commission.

Furthermore, there is the Suriname Built Heritage Trust (SGES), a public authority whose primary task is to optimize the management of Historic Buildings in Paramaribo. SGES has an advisory role with respect to the Ministry of Education, and SGES is the manager of the UNESCO listed Historic Inner City of Paramaribo.

The permits required for the current project are listed in Table 5: Overview of various permits required for current project.required for current project.

There is no monitoring done by the government agencies during construction as such. The agencies are only involved in issuing a permit (**Table 5**) and based on the permit, an inspection can be done but in practice this is not necessarily always carried out. For this Project, the PIU will carry out the environmental and social monitoring during construction.

[6] Sometimes referred to as Public Health.

Table 5: Overview of various permits required for current project.

PERMIT	RESPONSIBILITIES
	MINISTRY OF PUBLIC WORKS, TRANSPORT AND COMMUNICATION
Building Permit	The Director of the Ministry of Public Works is responsible for issuing Building permits (construction and renovations) The Department Building and house supervision (Bouw en Woningtoezicht) is responsible for inspection. The Minister of Education is responsible for issuing permits for demolishing, restorations, movement of monuments. The Commission Monuments care provides advice regarding monuments. The Archaeological Service provides advice regarding archaeological monuments. Other government agencies are involved in the permitting process by providing advice. These include the Labor Inspection, the Fire Department, and the Bureau of Public Health.
Demolishing Permit	When it comes to city and village views and it regards demolition of a monument, the Minister of Education is responsible for issuing demolishing permits When it comes to city and village views and it regards the construction and renovation of buildings, which may affect the spatial or structural cohesion, the Minister in charge of Public Works may grant a permit, after review of the plans for new construction and modification to existing buildings by the Construction Committee.
Parking Permit	The Ministry of OW is responsible for the issuing of permits for establishment of parking facilities for Office Space on public spaces. The Traffic department has developed their internal guidelines to calculate the number of parking spaces.
Authorization to place culverts and bridges	The Department for Wet Civil Technical Works of the Ministry of Public Works is responsible for the monitoring.
Permit for longer working hours	Ministry of Labor and the Head of Labor Inspection have the authority to sanction longer working hours than prescribed by law.
Permit for equipment	The Director of Labor issues inspection permit for the use of certain equipment like cranes. Re-inspection can be demanded.
Environment and Social Impact Approval	NIMOS provides guidance in the ESIA process. It is on a voluntary basis as it is not legally binding.

4 Description of the Proposed Project

4.1 Introduction

This chapter presents a summary description of the proposed project. The following paragraphs provide information that was available and collected during this stage of the ESIA study of:

- The landownership of the project sites;
- The land-use on the project sites and in the ESIA study area and;
- The different phases of the project during implementation and commissioning of the project beginning from the pre-design phase, followed by the construction phase and ending in the operational phase of the project.

The focus was on the buildings that are already selected for rehabilitation (4). The historic buildings that still need to be selected are discussed in general since there is little to no information yet available. An overview of the selected and yet to be selected buildings are listed in *Section 1.2 Project Background.*

4.2 Landownership

The following table gives an overview of the status of the landownership of the proposed project buildings which are already selected within this project.

Table 6: Landownership status proposed project buildings

Proposed project building	Address	Landownership
Department of Immigration of the Ministry of Justice and Police	Grote Combéweg 3	Government Property
Ministry of Justice and Police	Henck Arronstraat 1	
Ministry of Justice and Police,	Mirandastraat10	
Ministry of Social Affairs	Waterkant 32	

During the ESIA study the Consultant has requested landownership documents and plot cards from the Architects and the Ministries (Justice and Police and Social Affairs). Up to date no information has been received on this matter.

4.3 Land-use

4.3.1 Land-use Study area

From observations and surveys in the Area of Direct Influence (ADI) and the Area of Indirect Influence (AII) of the current study it could be concluded that the ESIA Study Area can be classified as an institutional/educational center. Most of the country's ministries and administrative centers are located within this area. Many of the historic buildings in the area are being used as government offices, such as

the Court of Justice, the Ministry of Justice and Police, the Presidential Palace, the Ministry of Natural Resources, the Ministry of Finance.

In the area, there are also schools and other higher institutions located.

Commercial activity has been observed but only along the main roads.

Based on Figure 2: Overview Classification of land use in the Historic Center (source: IDOM, 2018) and observations during field surveys the type of land use observed in the study area is classified as mainly institutional and educational (because of the presence of many schools and other educational institutes) and to a lesser extent commercial (small restaurants) and residential.

Figure 2: Overview Classification of land use in the Historic Center (source: IDOM, 2018)

4.3.2 Current land use of historical buildings and immediate land use of the surrounding

The Consultant conducted several surveys including one to determine the current condition of the selected project buildings and the activities within the surrounding area. The current condition of these buildings were captured and are presented with a description of the project buildings adjacencies in Table 7: Current state project buildings and description of project buildings adjacencies below.

Table 7: Current state project buildings and description of project buildings adjacencies

Building of Department of Immigration of the Ministry of Justice and Police, Grote Combéweg 3(picture taken 20th August 2018)  The building is adjacent to the following: - In the front parking space. - On the left are three containers, two belonging to BUVAS and one belonging to the Court of Justice. Documents were periodically stored in these containers since 2009. - On the right side the communication unit office of the Ministry of Interior Affairs. - On the rear side several other buildings connected to the monumental building	*Building of Ministry of Justice and Police, Henck Arron straat 1(picture taken 20th August 2018)*  The building is adjacent to the following: - In front at the north side partly parking spaces and partly sidewalk - On the west side two other buildings connected to the monumental building. - On the east side a sidewalk - On the south side connected a container and entrance to other buildings.
Building of Ministry of Justice and Police, Mirandastraat 10 (picture taken 20th August 2018)  The building is adjacent to the following: - In front at the north side small sidewalk which is also being used for parking - On the west side sidewalk.	*Buildings of Ministry of Social Affair, Waterkant 32(picture taken 20th August 2018)*  The building is adjacent to the following: - In front at the south side small sidewalk which is also being used for parking

- On the east side the project building is connected to another concrete office building of the Ministry of Justice and Police with central entrance hall and stairwell between the two buildings - On the south side 'De Kleine Historie' Guesthouse	- On the west side the project building is connected to another monumental building of the Ministry of Social Affairs - On the east side a side walk - On the north side Division of Ministry of Social Affairs

The details of the current land use on the project buildings sites and their immediate surroundings are shown in Figures 3-6 below:

Figure 3: Land-use Grote Combéweg 3 and immediate surrounding

Figure 4: Land-use Waterkant 32 and immediate surrounding

Figure 5: Land-use Henck Arronstraat 1 and immediate surrounding

Figure 6: Land-use Mirandastraat 10 and immediate surrounding

4.4 The proposed project

4.4.1 Introduction

The technical specifications and designs were assigned to two architects: KDV architects and Woei A Sioe Architects & Partners NV.

KDV Architects have prepared the designs and specifications for Waterkant 32 Ministry of Social Affairs (in the period from 2017 to 2018) and Mirandastraat 10 Ministry of Justice and Police (in the period from 2017 to 2018).

Woei A Sioe Architects & Partners have prepared the designs and specifications for the Grote Combé weg 3 Department of Immigration of Ministry of Justice and Police (in the period from 2012 to 2018) and Henck Arron straat 1 Ministry of Justice and Police (in the period from 2012 to 2018).

In accordance with the IDB, alternations were made in the specifications and drawings. The new specifications and drawings include only restoration (no expansion) and mixed uses (restaurants, gallery, and guesthouse) on the ground floor of the project buildings.

All the drawings and specifications were finalized in 2018 and these documents were reviewed by the ESIA consultants to get a better understanding of the project activities. The following sections describe the activities during the different phases of the project.

4.4.2 Pre-design Phase

The following table gives an overview of the activities that were conducted in the pre design/ planning phase with their current status during this ESIA:

Table 8: Pre design activities and status

	Activity	Components	Status
2	Preliminary design	Technical specifications and project drawings	Completed
3	Final designs	Technical specifications and project drawings	Completed June 2018
4	Tender documents	Submittal of Tender documents to Ministry of Public works for screening	Submittal completed
5	Tendering	Bidding process Awarding contractor for construction of project	pending

4.4.3 Construction Phase

The duration of construction/rehabilitation activities per historical building varies from 8 months to 14 months. The exact duration of the construction/rehabilitation activities was not included in all of the technical specifications. Only for the buildings of Grote Combéweg 3 and Henck Arronstraat 1, detailed information was included. It must be noted that the time schedule of the project will be updated as insights develop.

Table below shows the list of construction activities with their duration, which are often overlapping. *Note: The duration of each activity per building is dependent of the time schedule for that building. Because no clear time schedule of each building was available, the construction activities to be executed in general for all the buildings were listed. The duration of each activity listed in the table may vary for each building dependent on the nature and size.*

Table 9: Construction phase activities

#	Construction/rehabilitation activities Activities
1	Setting up temporary facilities
2	Measuring and setting out
3	Demolition works
4	Excavation works
5	Concrete works
6	Masonry Works including plaster works
7	Steel Constructions
8	Wood Works
9	Rehabilitation/construction Roof
10	New drainage and sewerage system with connection to existing main system
11	Tile Work
12	Walls (Gypsum Board walls and cement board walls)
13	Ceiling (Gypsum Board ceiling)
14	Restoration and partial replacement of the historic doors and windows(wood/aluminum)

15	Restoration of the wooden main frame
16	Sanitary Works
17	Paint Works and preservation
18	Installation Works (Full replacement of Installations e.g. electricity supply; water supply, data/voice installation, ventilation and air handling system)
19	Terrain Works

Manpower and equipment

Equipment expected to be on site during the construction phase are: heavy trucks, demolition/drilling machines, excavators and crane trucks, concrete mixing trucks and cranes, etc. This equipment may affect the flow of traffic and cause noise and dust hindrance. In this stage of the project it is not known how many people are in the construction team of the project. Before commencement of the construction phase the contractor awarded with the construction project will have to provide in his work plan details of the equipment to be used, manpower and a health, safety and environmental (HSE) plan.

Waste management

The project specifications include the following regarding waste management during the construction phase:

- Orderly execution (Specifications Grote Combéweg 3 and Henck Arronstraat 1)
  - During the execution of the Works the site should be maintained in a neat and orderly condition.
  - On completion of the Works, the Contractor shall see to it that the building and working space will be relieved from eventually barricades, excess materials, sheds, or other obstacles. The building- and working space will be delivered in a clean, smooth and austere finished condition to the gratification of the Management.
- Daily site cleaning (Specifications Mirandastraat 10 and Waterkant 32):
  - Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.
  - Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.
  - Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.
  - Collect and remove waste materials, debris, and rubbish from site weekly and dispose offsite
  - The project area should be maintained free of waste material, debris and rubbish and in orderly condition.
  - Debris and rubbish from pipe chases, plenums, attics, crawl spaces and other closed or remote spaces should be removed prior to enclosing the spaces.
  - Interior areas should be broomed and vacuumed prior to start of surface finishing and continuous cleaning should be done to eliminate dust.

In general, the following practices are applicable for all the buildings:

- Construction waste will be removed from the site weekly and will be disposed at a designated area at the national open dump site of Ornamibo. There is no waste permit required for construction activities.
- Domestic waste will be collected in waste bags and disposed at Ornamibo by regular waste management practices of the area (collection by the waste collection department of the Ministry of Public Works, Transportation and Communication).

4.4.4 Operational Phase

Operations can start when the buildings with their complete facilities are ready to be used for its intended purpose. The owner will likely have accepted care, custody, and control of the project well before this time.
The following table gives an overview of which operations/rooms are proposed in the restored project buildings. Based on the design, an estimate has been made of how many people will be working in the different rooms and in total per building. This is presented in Table 10: Operations/rooms in restored project buildings.

Table 10: Operations/rooms in restored project buildings

	Operations/rooms	**Number of people**
Department of Immigration of the Ministry of Justice and Police, Grote Combéweg 3		
Ground floor	- kitchen (cooking) - kitchen preparation or bar - restaurant seating area - restrooms	±5(kitchen staff) ±2 (kitchen or bar staff) Variable -
First floor	- restaurant seating area - kitchen/preparation/storage - balcony - restrooms	Variable ±5(kitchen staff) - -
Second/ top floor	- conference room - kitchenette	Variable -
	TOTAL	**12**
Building of Ministry of Justice and Police, Henck Arronstraat 1		
Ground floor	- commercial Area - utility Area - kitchenette - restrooms	Variable - - -
First floor	- office rooms(4x) - kitchenette - hall - restrooms - balcony	7 - - - -
Second/ top floor	- meeting room - office rooms(2x) - storage/cabinets - kitchenette - restrooms	Variable 8 - - -
	TOTAL	**15**
Building of Ministry of Justice and Police, Mirandastraat 10		
Ground floor	- office rooms(4x) - hall - central hall - restrooms	6 - - -
First floor	- office rooms(1x) - hall - central hall	8 - -

	- restrooms - storage room - canteen	- - -
Second/ top floor	- office room(1x)	12
	TOTAL	**26**
Building of Ministry of Social Affair, Waterkant 32		
Ground floor	- café - office room(1x) - gallery - kitchen - storage room - rest rooms	Variable 5 Variable - - -
First floor	- office rooms(2x) - restrooms - hall - AC concrete area	10 - - -
Second/ top floor	- office room(1x) - hall	12 -
	TOTAL	**27**

The Ministry of Justice and Police at Mirandastraat 10 is the only building out of the four selected buildings where mixed use has not been incorporated into the design. The building remains as government office on all floors. With the total estimation of people working per building an estimation of required parking spaces per building is made taking into account visits of groups of guests (for conference, restaurant seating etc.) and presented in the following Table. In this Table also the gap amount of required parking spaces for people working and visitors is given.

Table 11: Estimation table of required parking spaces and gap amount of parking spaces to be filled in

Project building	**Estimate of parking spaces for people working**	**Estimate of parking spaces needed for visitors**	**Estimate total required parking spaces for people working and visitors**	**Current amount of parking spaces**	**Gap amount required parking spaces to be filled in for people working and visitors**
Department of Immigration of the Ministry of Justice and Police, Grote Combéweg 3	12	30	42	5	37
Building of Ministry of Justice and Police, Henck Arronstraat 1	15	20	35	3	32

Building of Ministry of Justice and Police, Mirandastraat 10	26	10	36	4	32
Building of Ministry of Social Affair, Waterkant 32	27	12	39	10	29
				TOTAL	130

4.5 Project Alternatives

This section describes the alternatives that have been considered for the proposed project. The project offers limited opportunities for the analysis of alternatives, given that the project site is already determined. Therefore, only the no-project alternative and design alternative have been considered.

No-Project alternative

The no-project alternative describes the consequences in case the proposed project is cancelled. This option would implicate that the Ministry of Justice and Police and the Ministry of Social Affairs (owners of the selected buildings) would have no accommodation for their expansion of functions and would have to consider other available buildings or construction area. Ideally would be if these buildings are also situated in the inner city close to other government offices. Available space in the inner city is very limited. Another consequence of cancellation of this project would mean that the Historical Buildings being part of the UNESCO World Heritage Site, would not be restored at their original location with maintenance of the historic character of the buildings in the inner city. This would undermine the PURP program in which its component 1 stands for the renovation of urban spaces and of key heritage buildings. Because of these consequences for which other solutions are very limited, this no-project alternative is very undesirable. Also taking into account that this concerns the rehabilitation of an historic building (with historic value), this should be at its original location. Figure below presents the Cultural Property of the UNESCO World Heritage Site with the locations of the proposed project sites, of which almost all lie in the designated conservation zone.

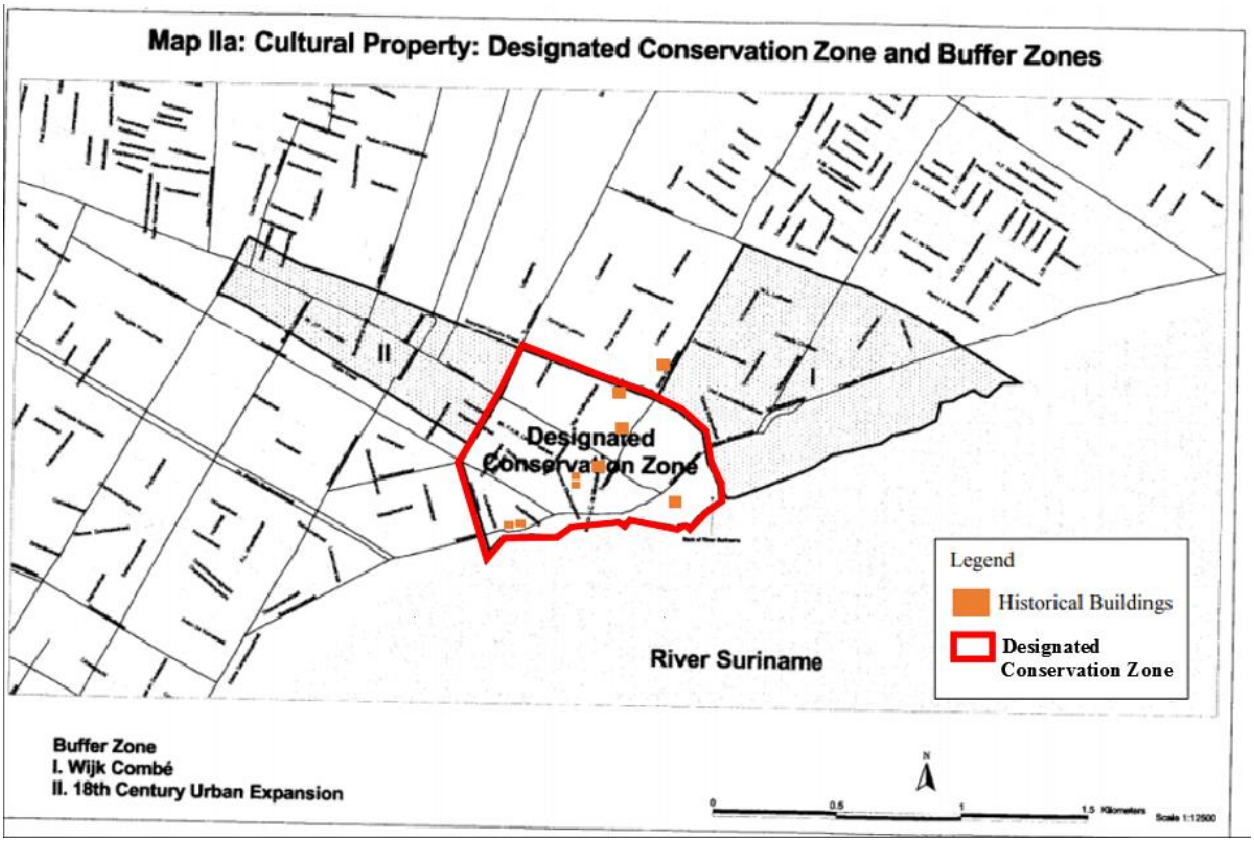

Figure 7: Designated Conservation Zone and Buffer Zones (© UNESCO World Heritage Centre 1992-2018)

Design alternative

On the 23rd of August 2018 and September 11th 2018 meetings were held with the Architects considering the design alternatives:

- alternative mixes of use;
- materials to be used (e.g. climate change aspects etc.);
- technology to be used (e.g. sewer infrastructure, energy supply/efficiency, water use efficiency etc.)
- operational aspects (e.g. parking facilities, traffic management

Ad I. Alternative mixes of use:
It was discussed in what manner the new buildings could also fulfill mixed uses. The first and upper floors of the buildings are designed for office space and conference. Only the ground floors of the buildings are designed for mixed use. The designs (necessary facilities included for design purpose) leave the possibility of creating variations of public use/mixed uses such as restaurants, gallery, guesthouse etc. It is unlikely that such modifications will affect the outcomes of the ESIA.

Ad II. Materials to be used (climate change aspects etc.):
It was discussed that the materials to be used as described in the technical specifications for the project are durable of quality and are resistant to moist, our climatological conditions, climate change factors as well as the effect of exhaust gases of cars. The architects have included all descriptions of the requirements of material to be used and proper treatment of the material for durability in the technical specifications.

Ad III. Technology to be used (e.g. sewer infrastructure, energy supply/efficiency, water use efficiency, etc.):
It was discussed how safe and efficient use of water and energy in the operational phase of the project was incorporated in the designs. Efficiency and safe use of energy and water have been incorporated in the designs through the following measures:

- Shafts and isolation have been incorporated.
- A less advanced air conditioning system was chosen instead of the proposed VRF (central) system where more interior units are connected to one exterior unit). This was done to lower the costs for installation and maintenance and reduce energy consumption.
- Piping of the buildings will mostly be done in the walls and ceiling or built up and shafts leading to the backside of the buildings.
- The exterior will be situated on the roof.

AdIV. Operational aspects (e.g. parking facilities, traffic management):
It was discussed which effects the buildings in operation could have on the current conditions in the surrounding area and how measures to mitigate the effects have been incorporated in the design. Due to limited space, there will be limited parking available also outside the project sites.

The problem of limited parking spaces in the inner city is a major challenge on its own and has to be solved through other strategic alternatives. Referring to Table 7, it can be concluded that with the rehabilitation of the historical buildings an additional 130 parking spaces may be required. KDV architects have already written a proposal for a parking garage with a capacity of approximately 750 parking spaces to create parking facility for the inner city. An ideal area for this parking garage still has to be created.

The minutes of the meetings with the architect are included in Annex IIIB, IIIE and IIIF.

5 Environmental Baseline

5.1 Geographical Location

Suriname is administratively divided in ten districts. The proposed project site is located within the historical Unesco World Heritage site of Paramaribo City, which is the capital of Suriname. The capital is located in the Paramaribo district (Figure 8) which borders Wanica district in the south and west. In the north, the coastal area of the district is bordered by the Atlantic Ocean and in the east the capital is bordered by the Suriname River. With a surface area of 182 km2, Paramaribo is Suriname's smallest district. This district and its near area (Wanica district) are populated with almost 65% of the total population in Suriname.

Figure 8: District of Paramaribo

The inner city of Paramaribo plays an important role in connecting the northern part with the southern parts of the main (sub) urban areas of Greater Paramaribo. It is noted that large population is concentrated in both the southern and northern part of the city.

In the next sections, the environmental and social baseline conditions at and around the site are presented.

5.2 Climate

5.2.1 Introduction

The climate of Suriname is tropical with abundant rainfall, uniform temperature, and high humidity. Most of Northern Suriname, including the study area, has a Tropical Rainforest Climate (Af-climate in Köppen's classification). The mean annual air temperature at Paramaribo is 27 º C, with a daily range of 9-13 ºC and an annual range of about 2ºC.

The average rainfall at Paramaribo is generally taken as representative of the country. Two wet and two dry seasons are to be observed, with about 50% of the annual rainfall occurring in the four month long wet season and about 20% in the two –month short wet season. The remaining of the annual rainfall occurs in the dry periods.

The weather of Suriname is dictated mainly by the northeast and southeast trade wind system called the Inter-Tropical Convergence Zone ("ITCZ" zone also known as the "Equatorial Trough"). The ITCZ follows the sun in its movement to the north to about 15º latitude and to the south to about 10º latitude south of the Equator. The ITCZ passes over Suriname twice per year causing heavy rainfall when it is overhead. This results in four seasons based upon rainfall distribution (Scherpenzeel 1977).

- Long Rainy Season End April-Mid August
- Long Dry Season Mid-August-Early December
- Short Rainy Season Early December-Early February
- Short Dry Season Early February-End April

The above classification of the seasons is developed for Paramaribo, using long-term rainfall data of meteorological stations situated in Paramaribo.

5.2.2 Climate in the study area

For the description of the climate of the study area, baseline data have been acquired from published sources within Suriname, and from records held by the Meteorological Services.

The meteorological stations Zorg en Hoop and Cultuurtuin are the nearest stations within the study area (see Figure 9), therefore the data from these two stations are used for the baseline climate conditions.

Figure 9: Overview of nearest meteorological stations to the project sites

5.2.2.1 Rainfall

Figure 10 shows the monthly average rainfall of the Zorg en Hoop Station over a longer period (data from www.meteosur.sr.). The station shows an annual total of 2,076mm. The highest total average monthly rainfall is recorded during the months May, June and July, which are in the Long Rainy Season, and minimum values are found during the months September to November, which are in the Long Dry Season.

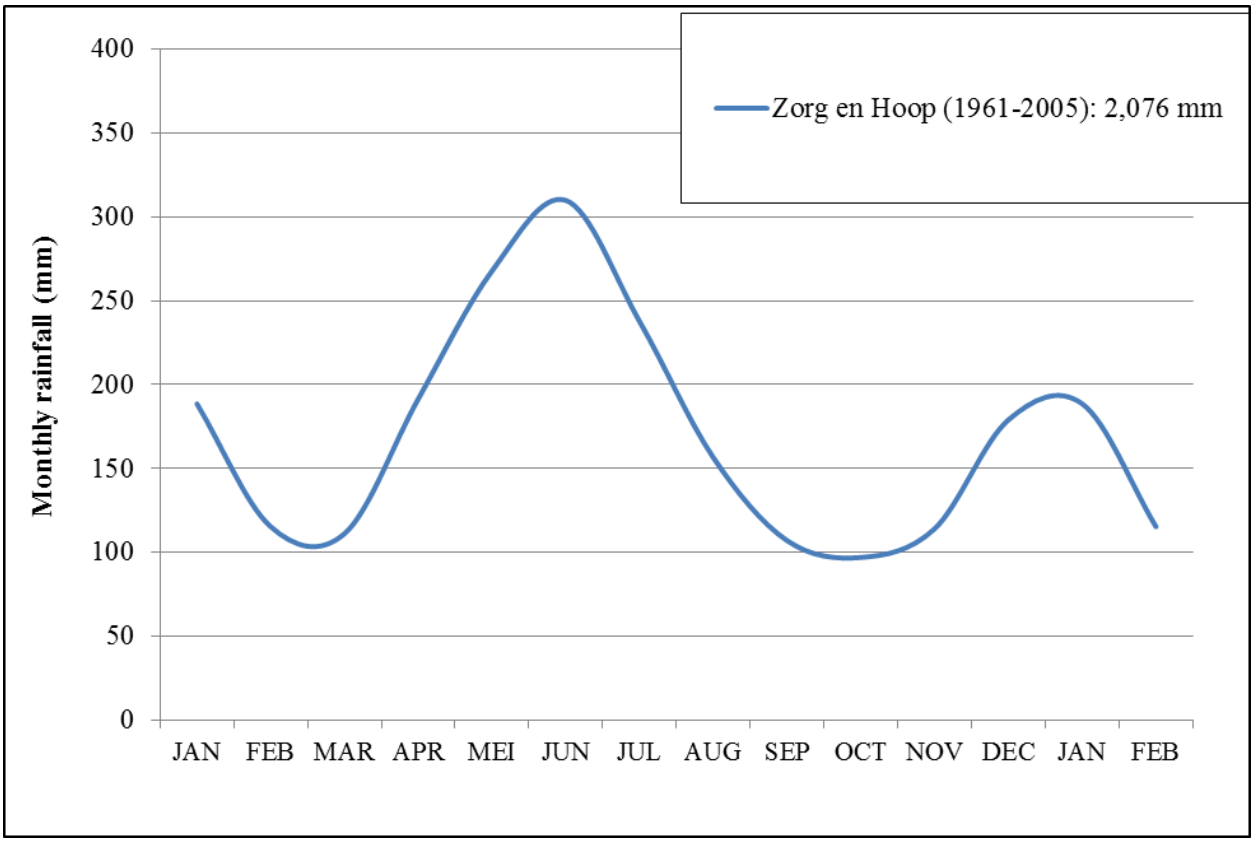

Figure 10: Long-term monthly average rainfall and annual precipitation of the Zorg en Hoop station

More recent rainfall data show similar annual totals, but a change in the pattern for the 2008-2017 period, with lower rainfall in January and higher rainfall in February (**Figure 11**). **Annual totals show a slight increase between the long-term data and the 2008-2017 data.**

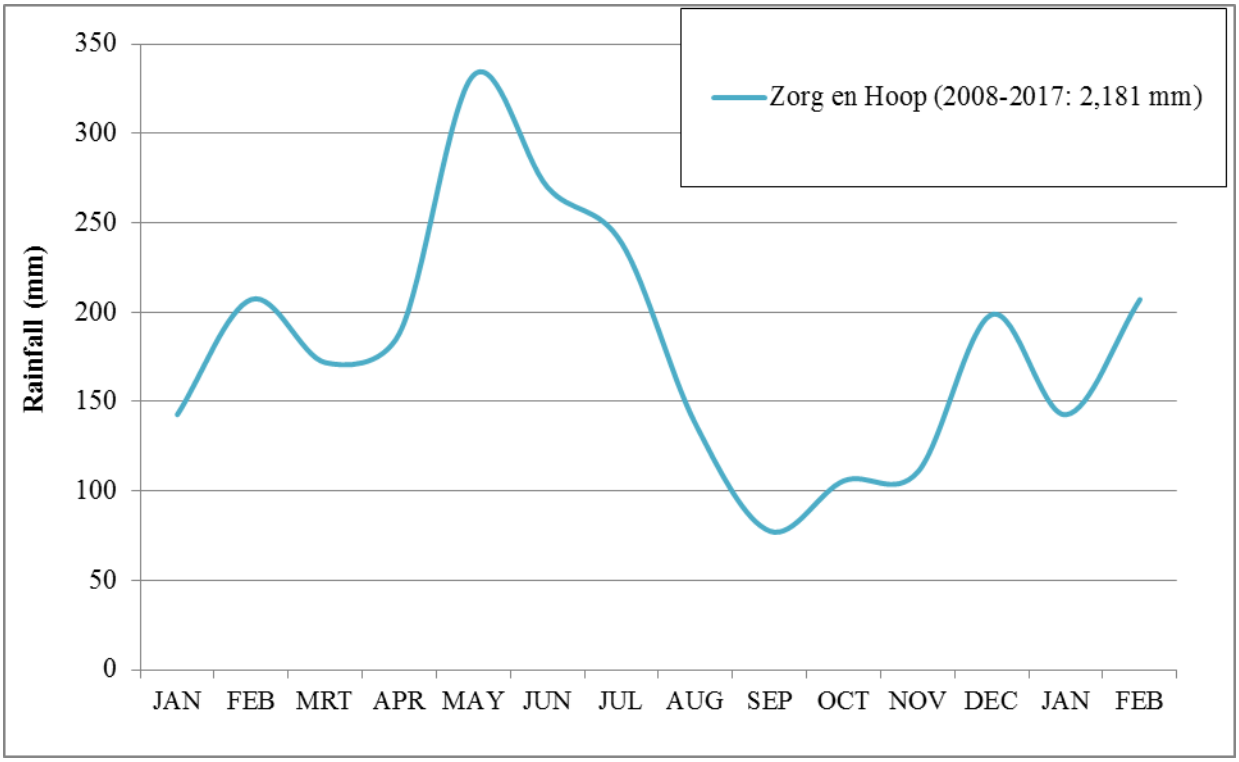

Figure 11: Recent average monthly and total annual precipitation for the Zorg en Hoop station

5.2.2.2 Temperature

The long-term mean monthly averages of the temperatures at station Cultuurtuin (1975-2004) are presented in **Figure 12Error! Reference source not found.**, together with the recent mean monthly temperatures. The longterm mean annual temperature till 2004/2008 for Cultuurtuin is 27.3°C. In general the warmest months are August through November (Long Dry Season) with averages of 28.1 and 28.5 respectively. The coldest months are January and February (Short Rainy Season), when the mean monthly temperature is 26.5 – 26.6 °C.

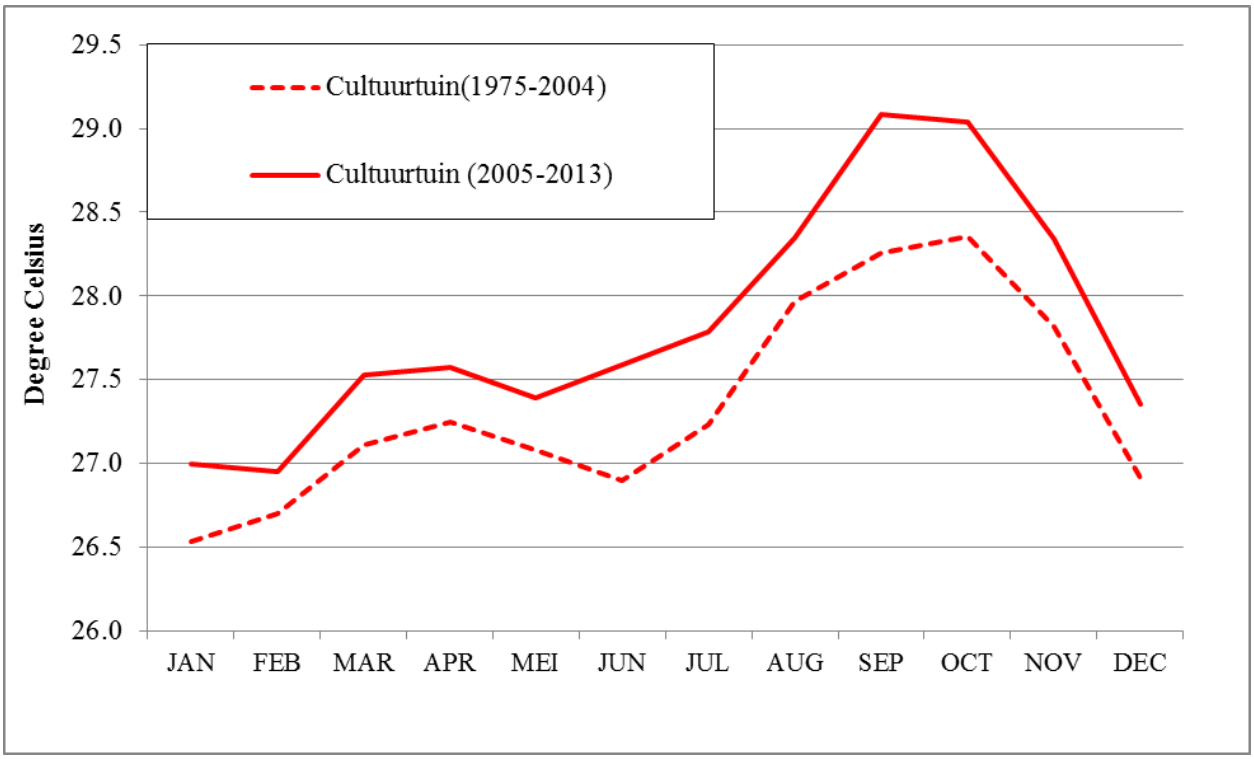

Figure 12: Mean monthly temperatures at the Cultuurtuin station (1975-2004)

When the mean monthly temperatures till 2004/2008 are compared with the more recent ones, it becomes clear that there has been a rise in temperature between the two periods.

Figure 13 presents the mean monthly temperatures and the maximum and minimum monthly means for Cultuurtuin over the period 2005-2013. Mean monthly maximum and minimum temperatures at Cultuurtuin follow the same trend as the mean monthly temperature, with higher maximum and minimum temperatures in the Long Dry Season and lower ones during the Short Rainy Season.

The highest mean monthly maximum occurs in October with 34.7º C, while the lowest mean monthly minimum is recorded for December and February with 20.8 º C. The monthly mean temperature range is 8.8-12.6º C and the annual range in the mean monthly temperature is 2.1º C.

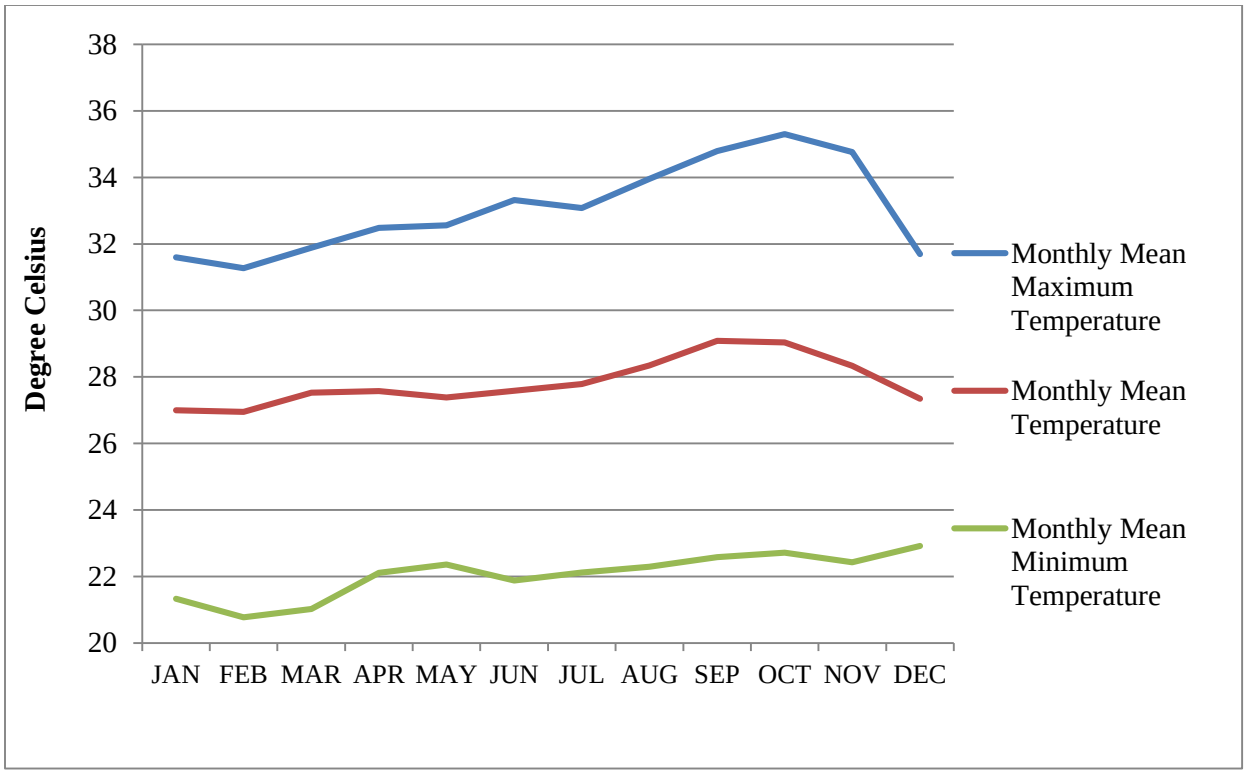

Figure 13: Monthly mean temperatures for Cultuurtuin (2005-2013)

5.2.2.3 Wind speed

In **Figure 14: Mean monthly for Zorg en Hoop (1991-2017)** the monthly mean and maximum wind speed is presented for Zorg en Hoop. The average annual windspeed is 1.4-1.5 m/s.

The highest mean windspeed is recorded in the February-April period, ranging between 1.6 and 1.8 m/s. The lowest ones are in June-August, ranging between 1.1 and 1.3 m/s. The windspeed is more or less correlated with the seasons, with higher windspeed in the dry seasons and lower ones during the rainy seasons.

The wind velocities are relatively high at the sea border and decrease further inland. As illustrated in **Error! Reference source not found.Figure 15,** the strongest winds appear to occur in the short dry season, when temperature gradients are highest.

Suriname is free of hurricanes. But short-lived wind speeds of 15-20 m/s (54-72 km/h), with occasional speeds up to 30 m/s (108 km/h) have been recorded during thunderstorms. These wind speeds are in line with data from Kourou in French Guiana, where maximum monthly wind speeds have been recorded since 1971 (Richard & Losada 2016). For about 98% of the months between 1971 and till 2014, the maximum windspeed is between 10 and 20 m/s. A peak of 30 m/s is only recorded once for a few seconds (June 2005). The other peaks lie between 21 and 23 m/s.

Such micro bursts are locally known as ‘sibibusi’ (sibi=sweep, busi=forest). They can result in considerable localized damage to buildings, infrastructure and trees (Richard, S. & C. Losada 2016. Risques naturels au Centre Spatial Guyanes. SDP/ES)

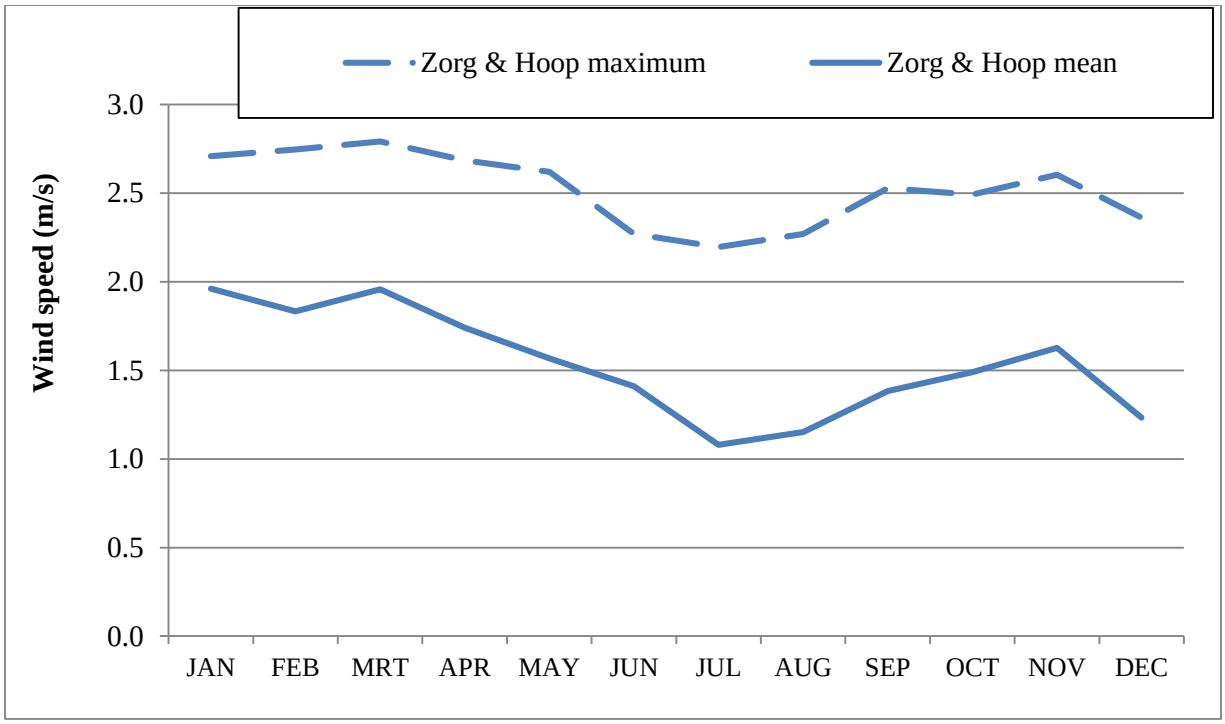

Figure 14: Mean monthly for Zorg en Hoop (1991-2017)

The course of the mean and maximum windspeed over the day is illustrated in **Error! Reference source not found.**
Figure 15 for Zorg & Hoop for the (extended) daytime period (06.00-21.00h).

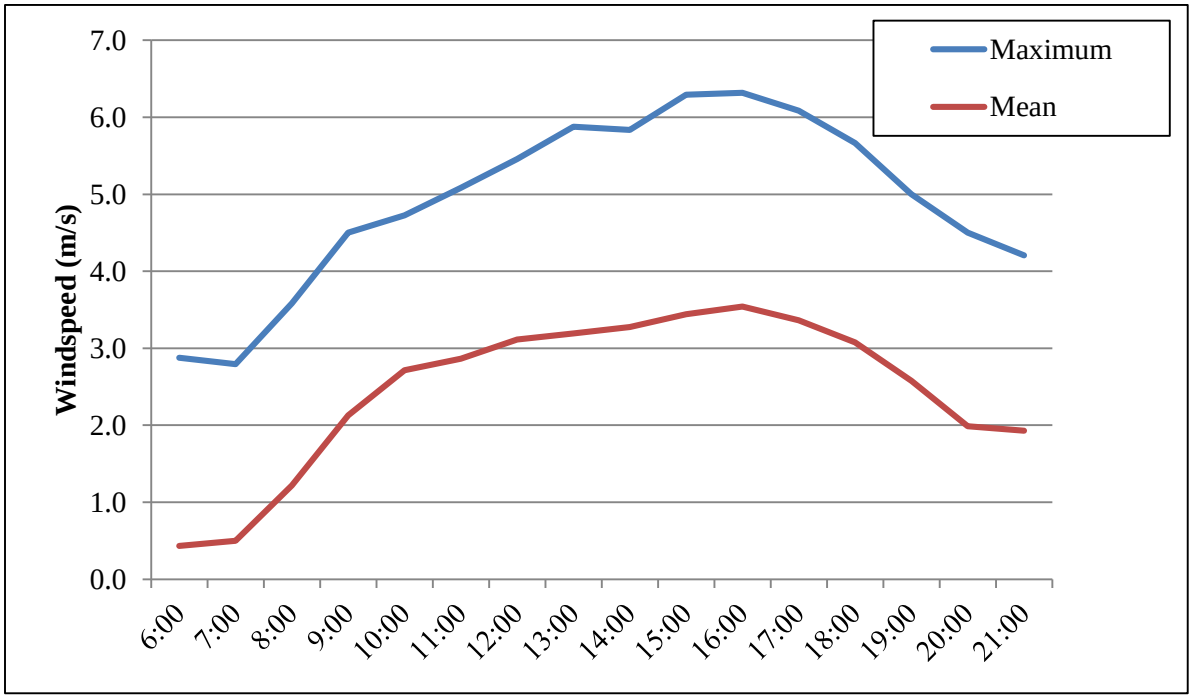

Figure 15: Average mean and maximum hourly wind speed for Zorg en Hoop (2017)

Calm winds, *i.e*. winds with hourly speeds less than 0.5 m/s, are very frequent in Paramaribo and most of Suriname, and occur over 50% of the time, and even over 60% of the time in the June-July period (Scherpenzeel 1977). During the night and early morning, it is usually calm. This is caused by the southerly land wind, which especially from May to December is well developed during the nights. This land wind dampens the effect of the trade winds, resulting in calm conditions during the night and the early morning. During the day the windspeed may increase to about 5 m/s, and in some seasons up to 7m/s, in particular in the February-April period. This is illustrated in above figures.

5.2.2.4 Wind Direction

The wind directions in Suriname are correlated to the position of the ITC-zone, whereby the directions NE to E usually have the highest frequencies.

Figure 16 presents the seasonal wind direction for Zorg & Hoop. Daytime wind direction is presented in **Figure 17.**

In the Short Rainy and Dry Seasons, northeasterly winds dominate, while in the Long Rainy Season also more easterly and southeasterly winds occur. During the Long Dry Season winds range between northeast and southeast.

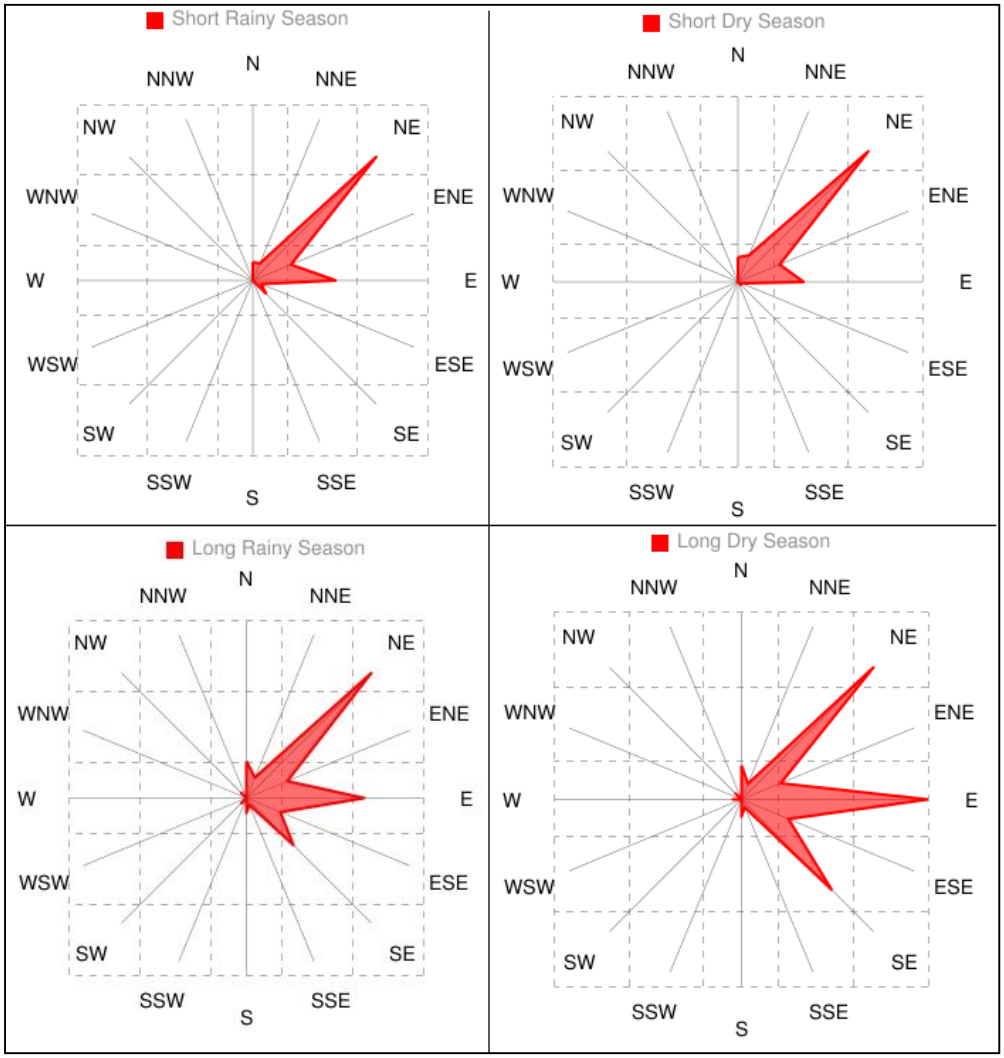

Figure 16: Wind roses presenting seasonal wind directions (Zorg en Hoop 1991-2017)

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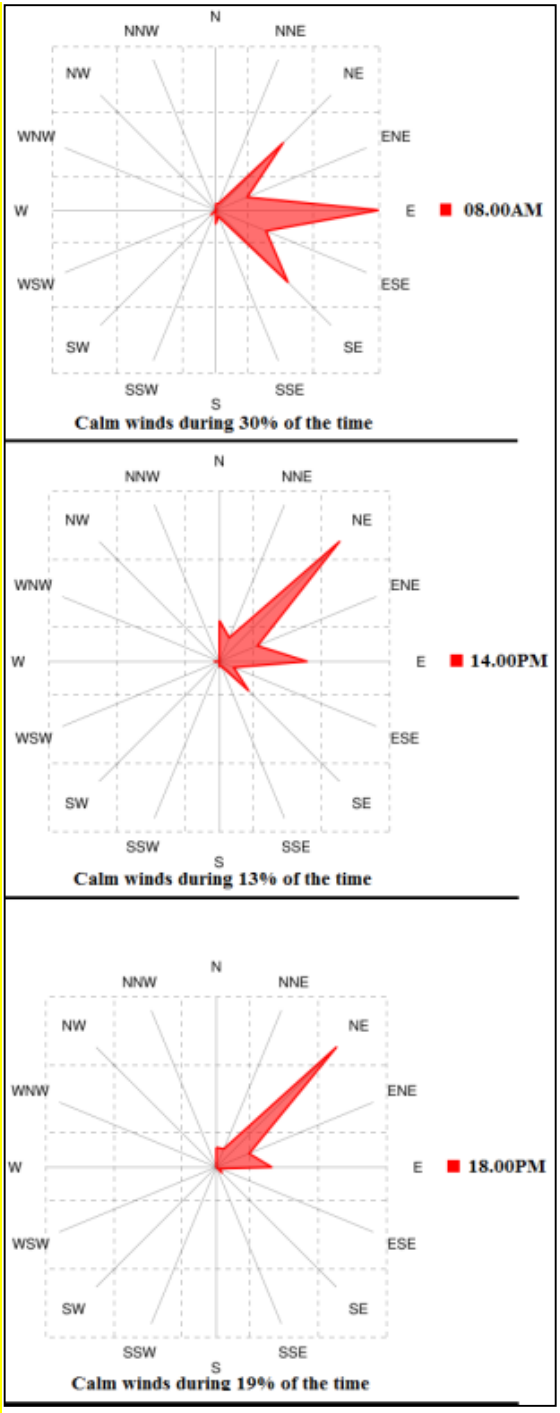

Figure 17: Wind direction during the day (Zorg en Hoop 1991-2017)

5.2.2.5 Relative humidity

Relative humidity (RH) reflects the seasons described above, with the highest average daily humidity in the rainy seasons and lower values in the dry seasons. RH is typically very high at night (close to 100% from midnight until 06h00), but after 06h00 the RH decreases, reaching its lowest value around 14h00. Minimum RH is slightly above 50% in the driest months of the Long Dry Season and around 70% in the rainy seasons.

5.2.2.6 Sunshine

Average daily sunshine ranges from 6 hours per day (40-60%) from December to June, rising to 8-9 hours per day (70-80%) in September and October.

5.2.2.7 Atmospheric stability

During the daytime, the atmosphere above Suriname is rather unstable due to thermal turbulence and moderate to high wind. During night-time, a much more stable atmosphere comes into existence due to calm wind conditions and cooling of the surface. According to Burger & von Reiche (2009), surface-based inversions in the study area may reach depths of 200-400 meter. During the night, a stable boundary layer with limited vertical mixing is present especially during nights with low or no wind.

5.2.2.8 El Niño–Southern Oscillation (ENSO)

The El Niño–Southern Oscillation is a single climate phenomenon that periodically fluctuates between three phases: Neutral, La Niña or El Niño. It is caused by a variation in winds and sea surface temperatures over the tropical eastern Pacific Ocean, affecting climate of much of the tropics and subtropics. The warming phase of the sea temperature is known as El Niño and the cooling phase as La Niña. The two periods last several months each (typically occurring every few years) and their effects vary in intensity.

For Suriname, El Niño causes drought, while La Niña results in morerainy conditions. However, the impact of ENSO varies in intensity and from place to place. Some El Niño events are extreme, e.g. the one of 1963-64 that resulted in 9 consecutive dry months, while others are hardly noticable. In additions, some El Niño are felt stronger in some parts of the country than in others, e.g. the 1997-1998 El Niño that was much more prominent in Nickerie than in Paramaribo.

Other extreme events in Suriname are the strong winds known as sibibusies (Sibi=sweep, Busi= Forest). Sibibusies are very strong winds which during heavy rains can achieve windspeeds of between 70-100 km/h. In 2013, approximately 300 houses / buildings were damaged as a result of strong winds. Floods and rainfall occurred in the districts of Paramaribo, Wanica, Saramacca and Marowijne, with a lot of material damage. In 2014 there was a hailstorm, of which about 150 houses / statues were damaged. Between 2014 and 2017 there were some heavy of wind, which caused damage, including one death and a few people injured. Suriname is more frequently faced with these heavy winds, which also increase in strength. From the eighth edition of the General Bureau of Statistics (Algemeen Bureau Statistiek, ABS) environmental statistics, the number of areas and households affected by natural disasters appear to have decreased. The peak was reached in Paramaribo in 2015. The last harmful squall was registered in October 2018, where a roof of a house was snatched away at the Kwattaweg, Paramaribo (source: Newspaper “Dagblad Suriname”, 10th of December 2018, Environmental Statistics, 8th Edition).

The Fire Department Prevention of Suriname was consulted for inquiry of fire safety plans for the inner city in case of fire outbreak that can be the consequence of increasing temperatures/drought. Currently there are no fire safety plans in place. Mr. Ho A Sjoe (Head of the Department Prevention) has stated in a telephone conversation on 5th of December 2018 that the following measures will be taken in case of fire outbreak in the inner city:

- Supply of water by 2 or 3 tankers for the fire trucks. The SWM supply of water in the fire pits is insufficient for the suction capacity of the fire trucks. For this reason, the Fire Brigade uses tankers for the water supply.
- Use of water from the Suriname River is considered if water supply is not enough for extinguishment in the inner city. This may be an option only if there is high tide.

The above mentioned measures are taken into account in the mitigation measures to be taken in the context of this proposed project. See Chapter 8

5.3 Air quality

5.3.1 Introduction

The air quality in the area is assumed to be suboptimal, due to human habitation and related activities. Sources of man-made air emissions that affect the air quality at the project sites include exhaust gasses from traffic along the roads and vehicles parked on the parking lots in the vicinity. These emissions occur mainly during day time hours on weekdays.

Dust may be experienced in particular during dry periods. The proposed project sites and immediate surrounding area are almost completely paved with the result that the atmospheric dust originates from unpaved parts in the project sites, the vicinity of the project sites and from unpaved areas at further distance carried through the north-eastern air (wind) flows.

The impact zone is related to the dominating north-eastern winds at day-time. An impact of current air pollution only occurs where receptors are downwind and sufficiently close.

The Consultant has set up an air quality measuring instrument (Aeroqual AQS1 12102017-630 Dust Profiler with Weather Station) on two locations within the ESIA study area. The locations were mainly selected on prevailing winds (free of obstacles), traffic activity and presence of sensitive receptors.

- Location 1: Parliament Building site at the corner of the Henck Arronstraat and the Grote Combéweg. Measurement period: 22nd of October till 6th of November 2018
- Location 2: On the terrain of the Centrale Bank van Suriname at the Waterkant 20 downwind of the first location. Measurement period: 9th of November till 23rd of November 2018.

Twenty four hour measurements of the local air quality (dust and gasses) were carried out. **Figure 18** below gives an overview of the two air quality measurement locations. The measured values per location and in comparison are discussed further in this section.

Figure 18: Overview air quality measuring locations.

Figure 19 and Figure 20 are pictures taken from the Air Quality Instrument at both locations after installation.

Figure 19: Overview Air Quality Instrument at Location 1 (picture taken on the 22nd of October 2018)

Figure 20: Overview Air Quality Instrument at Location 2 (picture taken on the 9th of November 2018)

In the absence of outdoor air quality guidelines for Suriname, the available WHO guidelines of 2005 are used to assess the collected data. See Table below for the WHO Guidelines for air quality (2005).

Table 12: WHO Guidelines for air quality (2005)

	24-hour mean/8-hour mean/1-hour mean/10-minute mean	**Annual mean**
PM2.5 (fine particular matter particles with a diameter of 2.5 microns or less)	25 µg/m3 24-hour mean	10 µg/m3 annual mean
PM10 (fine particular matter particles with a diameter of 10 microns or less)	50 µg/m3 24-hour mean	20 µg/m3 annual mean
O3(Ozone)	100 µg/m3 8-hour mean	
NO_2 (Nitrogen dioxide)	200 µg/m3 1-hour mean	40 µg/m3 annual mean
SO_2 (Sulfur dioxide)	500 µg/m3 10-minute mean 20 µg/m3 24-hour mean	

5.3.2 Results

In this section the results of the air quality measurements (dust and gasses) are analyzed and presented below.

5.3.2.1 Location 1- DNA terrain

Dust

Table 13 and **Figure 21** present the average 24-hour mean for PM1.0, PM 2.5 and PM 10 and the Total Suspended Particles (TSP) in the period from 22nd of October-6th of November 2018 on Location 1.

Table 13: Average 24-hour mean and peak 24 hour mean values for PM1.0, PM 2.5 and PM 10 and the Total Suspended Particles (TSP) during measuring period on Location 1

Parameter	Average 24-hour mean in µg/m³	Peak 24-hour mean value µg/m³, date
PM1.0	1.2	2.88, November 1st 2018
PM2.5	2.7	4.01, November 1st 2018
PM10	3.4	4.73, November 1st 2018
TSP	5.2	5.16, October 22nd 2018

The following can be concluded from the measured dust data on Location 1:

- PM 2.5 and PM 10 values lie below the WHO guidelines of respectively 25 µg/m3 for PM2.5 and 50 µg/m3.
- The possible sources of fine dust resulting in peaks are traffic, moving vehicles and other commercial activities upwind of the project site. This correlates to the traffic data and peaks as described under section 5.4

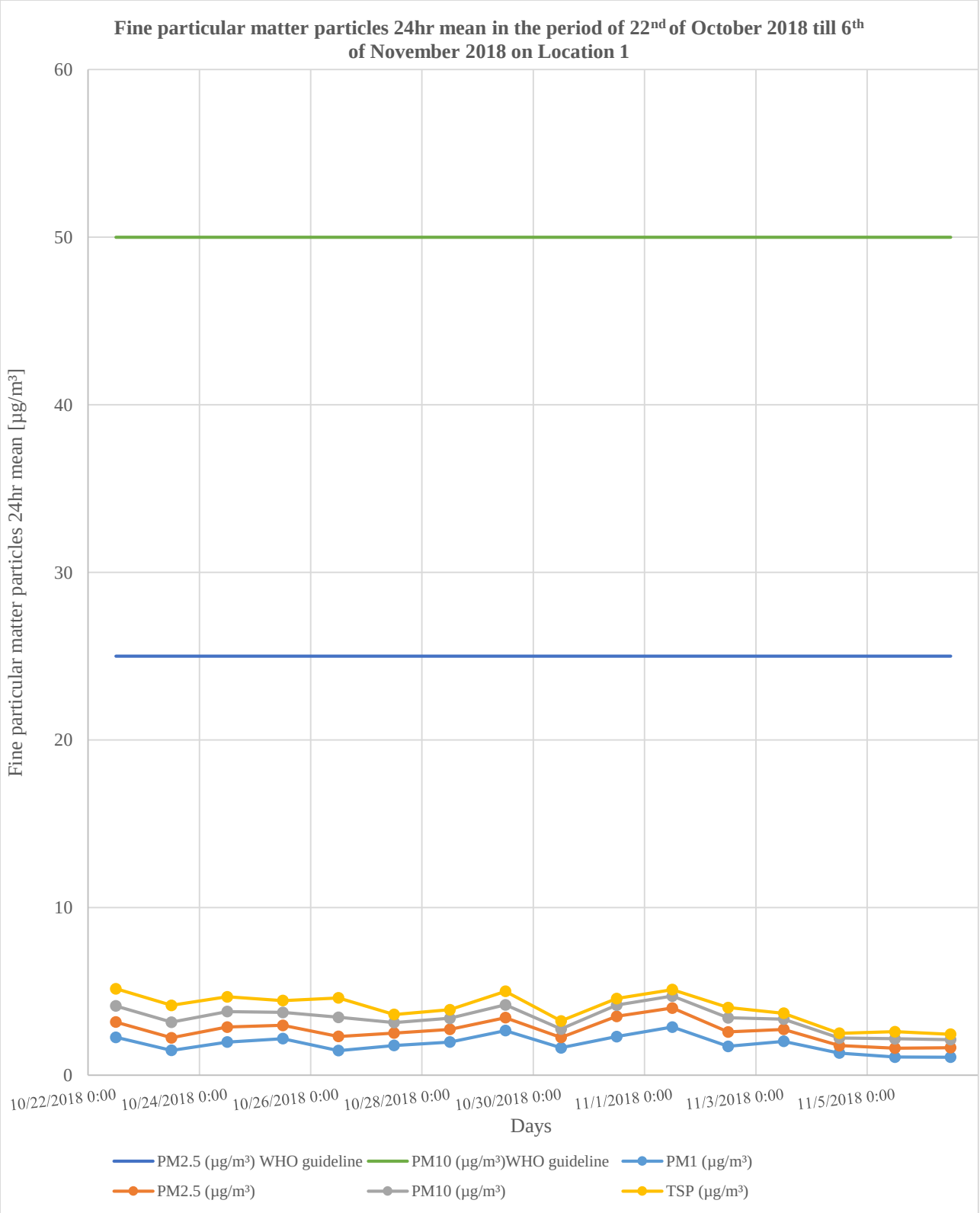

Figure 21: Fine particular matter particles 24hr mean in the period of 22nd of October 2018 – 6th of November 2018 on Location 1

Gasses

Figure 22 presents the 1 hour mean is presented for cNO_2 in the period from 22nd of October – 6th of November 2018 on Location 1

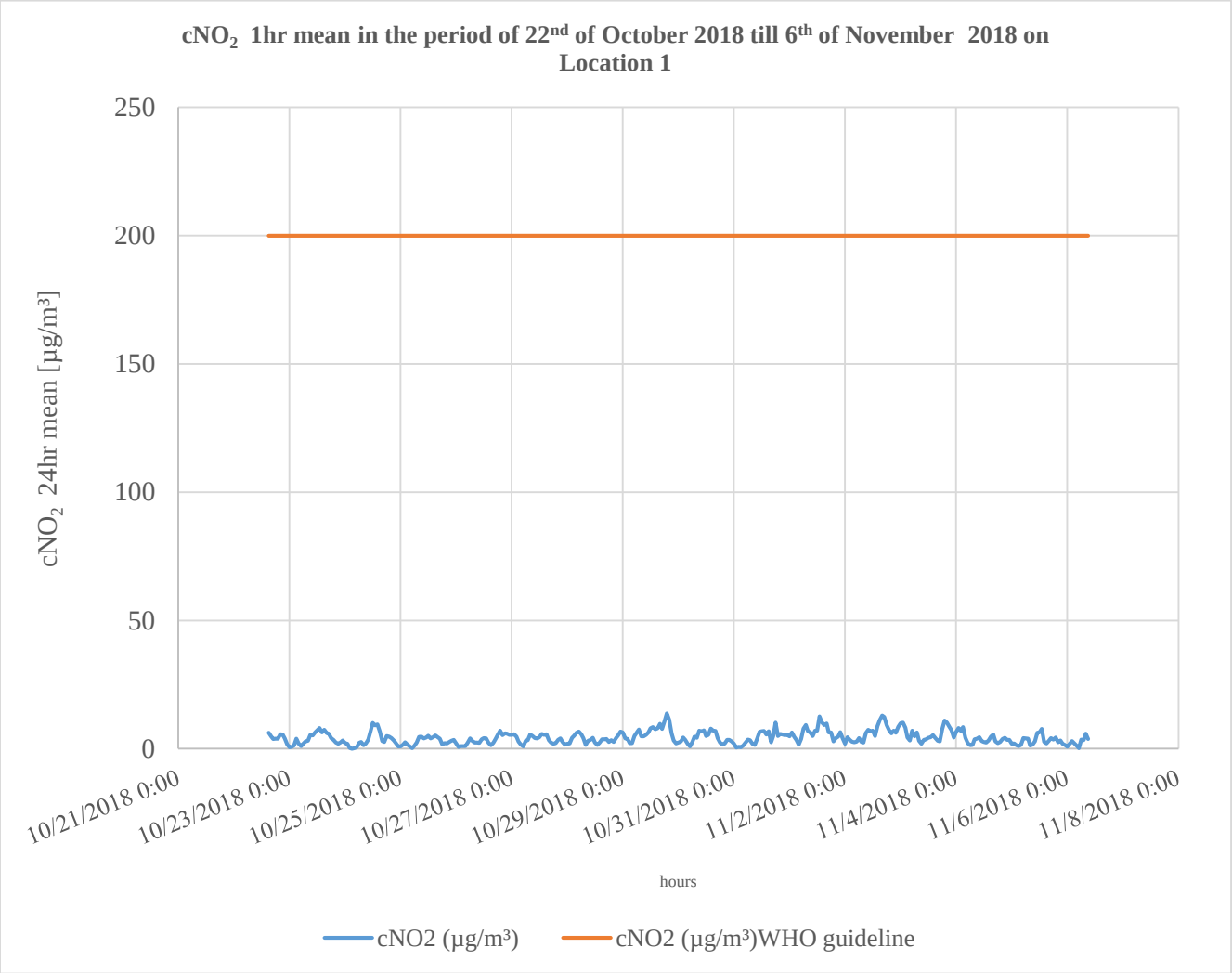

Figure 22: cNO2 1hr mean in the period of 22nd of October 2018- 6th November 2018 on Location 1

The measured peak values on Location 1 vary between 6.7-13.8 µg/m³. The highest peak value of 13.8 µg/m³ was measured around 19.00pm on Monday 29th of October 2018. All the measured values lie below the 1-hour mean WHO guideline of 200 µg/m3 for NO_2

Peaks were observed:

- Daily in the afternoon between the hours of 12.00-16.00pm except on Saturday and Sunday.
- During the night between 18.00pm-20.00pm (29th, 31st of October and 3rd of November 2018) and
- Early mornings between 1.00-3.00 am (3rd and 4th of November 2018).

The possible sources of cNO2 include traffic, moving vehicles and other commercial activities upwind of the project site. This also correlates to the traffic data and peaks as described under section 5.4

Figure 23 presents the 24 hour mean for SO_2 for the period 22nd of October till 29th of October 2018 on Location 1.

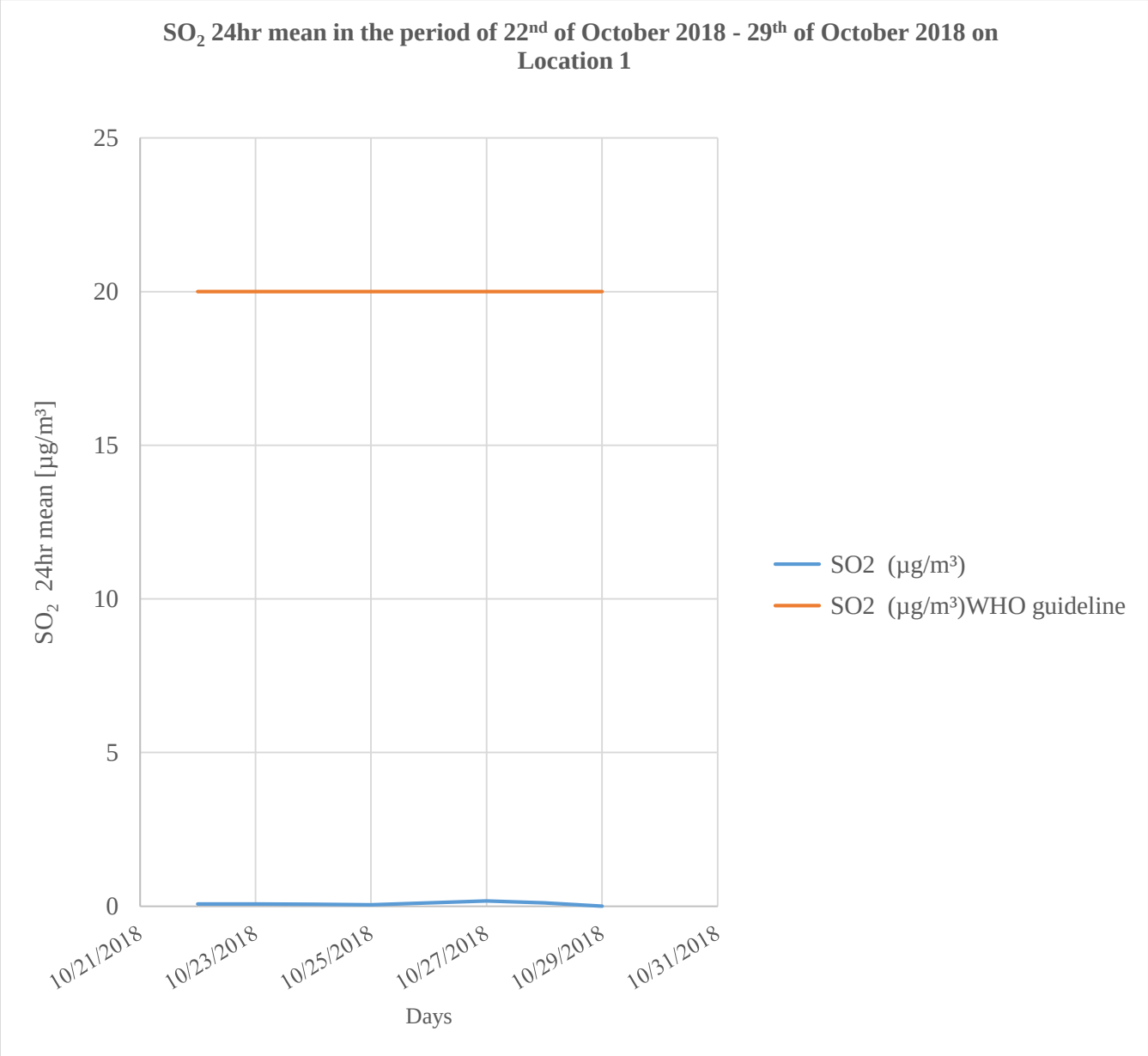

Figure 23: SO2 24hr mean in the period of 22nd of October 2018 - 29th of October 2018 on Location 1

In de period of 22nd of October to 29th of October the highest 24-hour mean for SO2 was 0.17 µg/m³ and this was measured on Saturday 27th of October. All measured values are below the 24-hour mean WHO guideline of 20 µg/m3 for SO2.
The possible sources of SO2 include traffic, moving vehicles and other commercial activities upwind of the project site. This also correlates to the traffic data and peaks as described under section 5.4

5.3.2.2 Location 2- CBvS terrain

Dust

Table 14 and **Figure 24** present the average 24-hour mean for PM1.0, PM 2.5 and PM 10 and the Total Suspended Particles (TSP) in the period from 9th of November-23rd of November 2018 on Location 2.

Table 14: Average 24-hour mean and peak 24 hour mean values for PM1.0, PM 2.5 and PM 10 and the Total Suspended Particles (TSP) during measuring period on Location 2

Parameter	Average 24-hour mean in µg/m³	Peak 24-hour mean value µg/m³, date
PM1.0	2.1	3.38, November 10th 2018
PM2.5	3.1	4.95, November 10th 2018
PM10	4.1	5.73, November 10th 2018
TSP	4.6	6.71, November 23rd 2018

The following can be concluded from the measured dust data on Location 1:

- PM 2.5 and PM 10 values lie below the WHO guidelines of respectively 25 µg/m3 for PM2.5 and 50 µg/m3.
- The possible sources of fine dust resulting in peaks are traffic, moving vehicles and other commercial activities upwind of the project site. This correlates to the traffic data and peaks as described under section 5.4

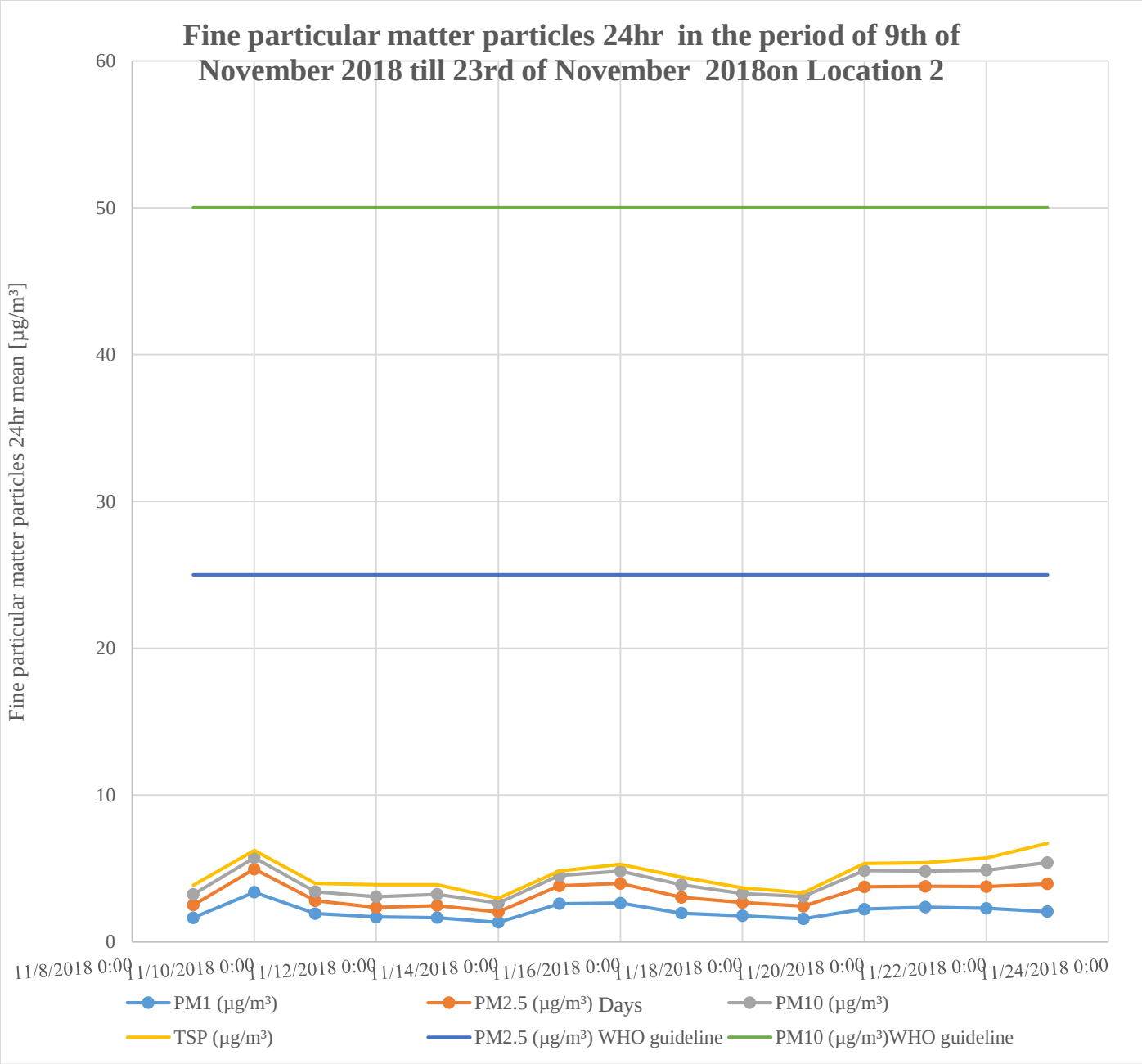

Figure 24: Fine particular matter particles 24hr mean in the period of 9th of November-23rd of November 2018 2018 on Location 2

Gasses

Figure 25 presents the 1-hour mean is presented for cNO_2 in the period from 9th of November-23rd of November 2018 on Location 2.

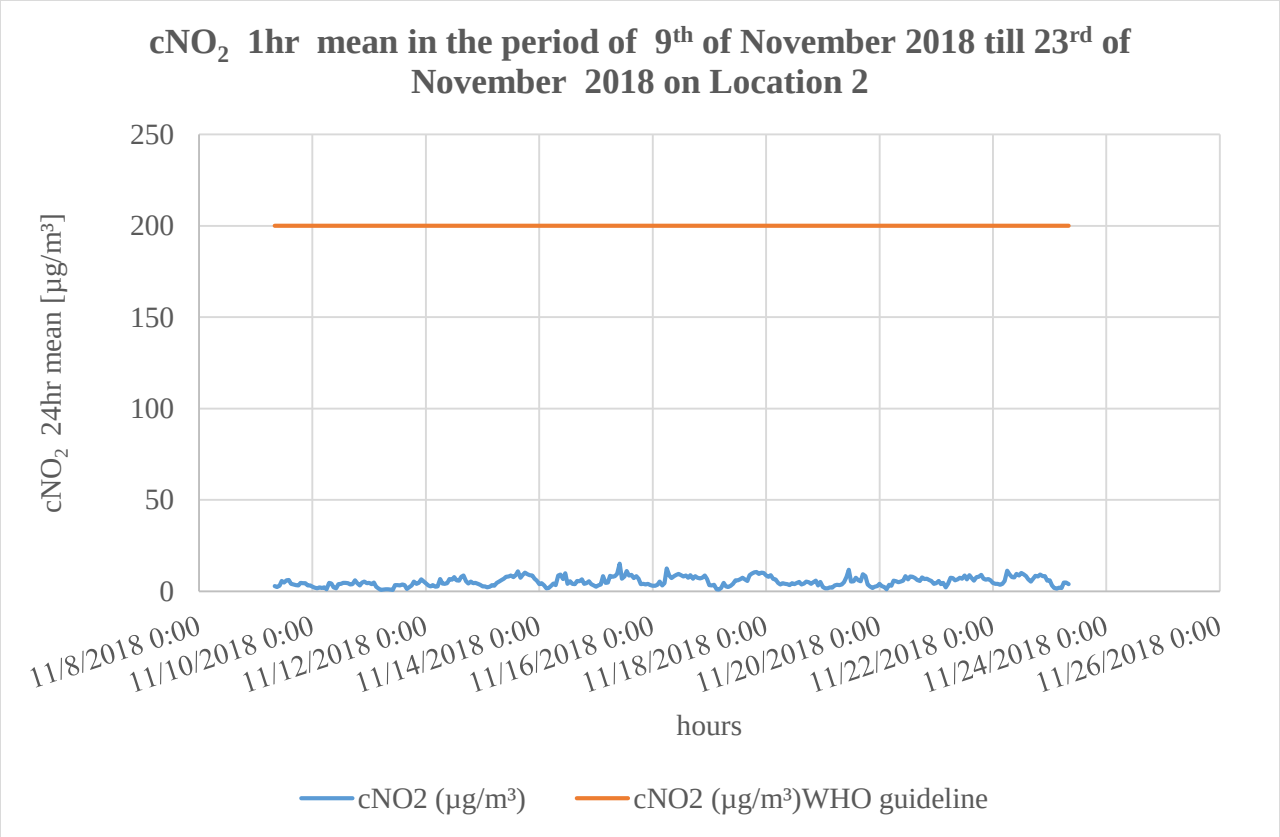

Figure 25: cNO2 1hr mean in the period of 9th of November 2018 – 23rd of November 2018 on Location 2

The measured peak values on Location 2 vary between 6.2-15.1 µg/m^3. The highest peak value of 15.1 µg/m³ was measured around 10.00am on Thursday 15th of November 2018. All the measured values lie below the 1-hour mean WHO guideline of 200 µg/m3 for NO_2

Peaks were observed:

- Daily between the hours of 6.00am to about 22.00pm except on Saturday and Sunday.
- Values exceeding 6.0 µg/m³ were measured continuously for a minimal of 9 hours straight mostly on weekdays (Tuesday 13th of November, Friday 16th of November, Tuesday 20th of November, Wednesday 21st of November and Thursday 22nd of November)

The possible sources of cNO2 include traffic, moving vehicles and other commercial activities upwind of the project site. This also correlates to the traffic data and peaks as described under section 5.4

Figure 26 presents the 24- hour mean for SO_2 for the period from 9th of November-23rd of November 2018 on Location 2.

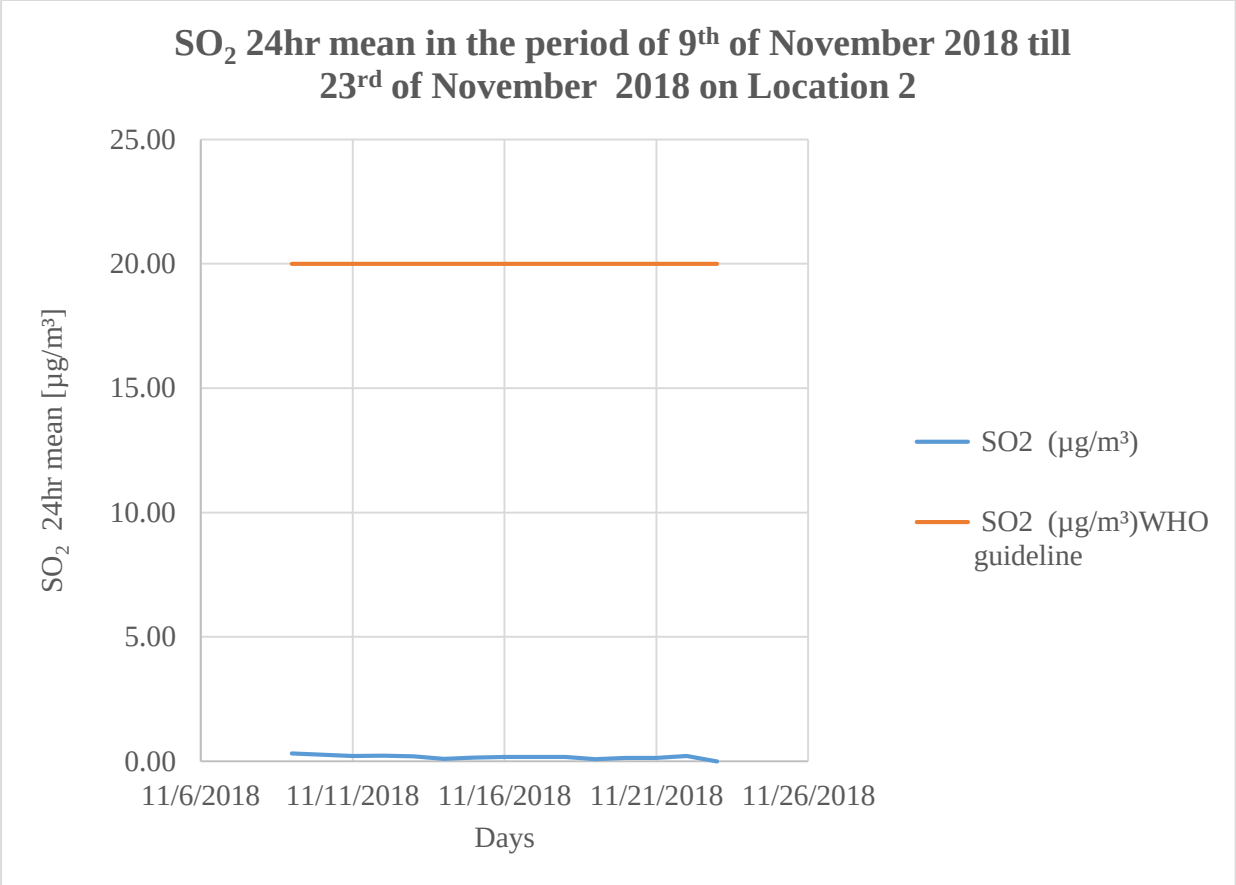

Figure 26:SO2 24hr mean in the period of 9th of November 2018 – 23rd of November 2018 on Location 2

In de period from 9th November till 23rd of November 2018 the highest 24-hour mean for SO2 was about 0.32 µg/m³ and this was measured on Friday 9th of November. Measurements on this day started to increase after 11.00am and started to drop after 16.00pm. The maximum 24-hour mean of 0.32 µg/m³ lies below the 24-hour mean WHO guideline of 20 µg/m3 for SO2.

The possible sources of SO2 include traffic, moving vehicles and other commercial activities upwind of the project site. This also correlates to the traffic data and peaks as described under section 5.4

5.3.3 Conclusion

This section gives an overview of the main findings of the results of the air quality measurements at both locations. Also, the results of both locations were compared and are presented below.

In **Table 15** below a comparison of the air quality between the results of Location 1 and 2 against the WHO guidelines is presented.

Table 15: Comparison of the air quality between Location 1 and 2 against the WHO guidelines

Measured values [µg/m³]	**DNA terrain[µg/m³] (measuring period 22nd October-6th of November 2018)**	**CBvS terrain[µg/m³] (measuring period 9th November-23rd of November 2018)**	**Average of DNA terrain and CBvS terrain [µg/m³]**	**WHO guideline[µg/m³]**
Average 24-hour mean PM2.5 of measuring period	2.7	3.2	3.0	25
Average 24-hour mean PM10 of measuring period	3.4	4.1	3.8	50
Highest 24 hour mean TSP	5.16	6.71	5.94	
Peak range of 1 hour mean cNO_2 of measuring period	6.7-13.8	6.2-15.1		
Average 1 hour mean cNO_2 of measuring period	4.33	5.31	4.82	200
Highest 1 hour mean cNO_2	13.8	15.1	14.5	200
Average 24 hour mean SO_2 of measuring period	0.08	0.17	0.13	20
Highest 24 hour mean SO_2	0.17	0.32	0.25	20

Comparing the results of the measurements of the local air quality on Location 1 and 2 according to **Table 15** the following can be concluded:

- The average of the local air quality measurements of Location 1 and Location 2 are below the WHO guidelines.
- For cNO_2 measurement peaks appeared mostly during daytime on Location 1 between the hours of 12.00pm to 16.00pm on weekdays while on Location 2 peaks appeared mostly during daytime between the hours of 6.00am to about 22.00pm on weekdays.
- The possible sources for cNO_2 and SO_2 resulting in peaks are traffic, moving vehicles and other commercial activities upwind of the measuring location.
- All the measured values (average and peaks) of the parameters from Location 2 are higher than the measured values from Location 1. The traffic study done as part of this baseline as well the results of the traffic counts are presented in the next section 5.4. From the counts can be seen that the amount of traffic that passes the Parliament Building site, along the Henck Arron straat and Grote Combéweg is more than the amount of traffic that passes CBvS terrain along the Waterkant (see **Table 16: Total traffic counts per location).** Yet the measured cNO_2 and SO_2 values are still lower on the Parliament Building site than on CBvS terrain. This could be accounted to the fact that the DNA terrain is a more open space close to the Palm Tree Garden (more dilution by free flowing winds). The terrain of the CBvS is enclosed by higher buildings with no free flow of the wind which could have resulted in accumulation of dust and gasses and thus the higher results.
- The CBvS terrain lies downwind of the Parliament Building site, so that all commercial activities and moving traffic upwind of CBvS terrain, including the activities on Parliament Building site, may have contributed to the local air quality on CBvS terrain.

5.4 Traffic

In 2018, the Strategic Urban Mobility Plan for Paramaribo Historic Center was published by IDOM (Mexico) funded by IDB. This study concluded that the inner city of Paramaribo is a key factor area for the mobility of Paramaribo. It connects the northern with the southern parts of the main urban area of Suriname. Due to the large population concentrated in both the southern and northern part of the inner city, an important number of generated and attracted trips take place. In total about 55% of the traffic in the inner city is only through traffic, while 45% of the traffic has its destination to the inner city.

Furthermore, the study showed that:

- Several factors lead to congestions in the inner city. One of these factors is the presence of complex vehicular intersections and discontinuity of traffic lanes.
- The traffic intensity at the Henck Arronstraat, part of the Waterkant and Dr. S. Redmondstraat are between 500-900 vehicles per hour during weekdays.
- Peak hours can be distinguished in the morning and in the afternoon. The morning peak period is between 06:30 and 09:30, with highest traffic activity between 07:00 and 08:00. In the afternoon the traffic starts to increase early around 12:00 pm and reaches its peak between 16:00 and 18:00.

The project site is located next to the thoroughfares Henck Arronstraat and Grote Combéweg. The Henck Arronstraat is a one- way street, which connects East Paramaribo with the historical inner city. Traffics lights are used to dose traffic. In the Henck Arronstraat sidewalks are available. There are several private parking lots; few public parking spaces are also available in the Henck Arronstraat from the Jessurunstraat to the crossroads with the Grote Combéweg.

The Grote Combéweg is a two- way street, which connects the Paramaribo city center with North Paramaribo, and provides access to the Van Sommelsdijckstraat. In the Van Sommelsdijckstraat several restaurants are located. The Court of Justice and the main entrance to the historic Palm Tree Garden are both located within the ADI along the Grote Combéweg. There are several parking spaces available along the Grote Combéweg.

The area is known for the many offices, governmental and non-governmental, which are located primarily in the Henck Arronstraat, Mr. F.H.R. Lim A Postraat, Mr. J.C. De Mirandastraat and Tamarindelaan.

Based on the existing information as mentioned above, the location of the project with the currently foreseen project activities, 4 locations were selected to carry out traffic measurements in order to give a representative image of the traffic intensity and traffic flows in the inner city. See below **Figure 27** Overview of Traffic Measurement Locations.

Figure 27: Overview of Traffic Measurement Locations

The traffic study (count) was executed on the 2nd of October 2018 (weekday) during the morning and afternoon peak hours. At each location (4 in total, T1-T4) three measurements were carried out of half an hour each, during three different time intervals (morning between 6.30-9.30, afternoon between 12.30 and 15.30 and between16.00-18.45).

The total motorized traffic intensity (cars, trucks, busses, motorbikes and bikes) counted at each traffic location T1 to T4 per half an hour time interval is presented in section 5.6 Noise in **Error! Reference source not found.**. For detailed results see Annex IIA:Baseline Traffic Study report

The results of the total traffic counts per location for the 2nd of October 2018 are presented in the **Table 16** and the **Figure 28**.

Table 16: Total traffic counts per location

	T1 Henck Arronstraat, Grote Combeweg, Tamarinelaan and Onafhankelijkheidsplein	**T2** Onafhankelijkheidsplein, Waterkant, Kleine Waterstraat and Zeelandiaweg	**T3** Mr. F.H.R. Lim A Postraat and Mr.J.C. de Mirandastraat	**T4** Waterkant and Kromme Elleboogstraat
Category	**Total**	**Total**	**Total**	**Total**
Cars	1876	1858	781	1006
(Light) Trucks + busses	272	305	105	149
Large Trucks	8	13	1	9
Motorbikes + bikes	225	215	92	160
Pedestrians	72	52	102	151
Total	**2453**	**2443**	**1081**	**1475**

From the table it can be concluded that of all vehicle types cars are mostly observed at all locations during all measurement periods. The IDOM/IDB report concluded that public transportation isn't very organized within the inner city. People are therefor likely to use a car as transportation method. This is more or less confirmed in the current study.

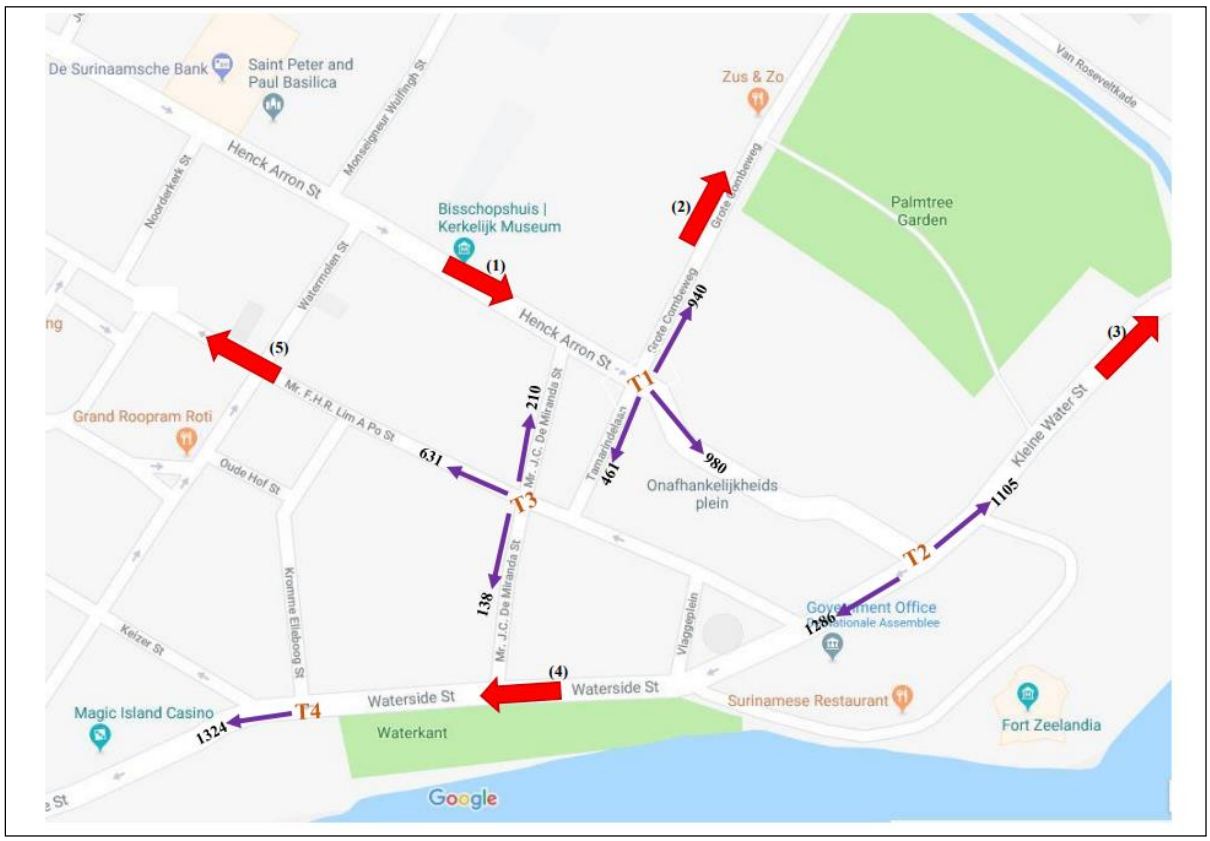

Figure 28: Overview total traffic counts per location

From **Figure 28** the following can be concluded:

- Most traffic moves along the Henck Arronstraat (1), Grote Combeweg (2), Kleine Waterstraat (3), Waterkant (4) and Mr. Lim A Postraat (5). In the IDOM/IDB report it was concluded that traffic mostly moves along the Henck Arronstraat, Waterkant, Keizerstraat and Domineestraat. In the current study, the traffic movement is mostly as mentioned in the IDOM/IDB Report. At location T1 (junction Henck Arronstraat/Grote Combeweg), the overall traffic intensity at this

location was higher in comparison to the other locations. The Henck Arronstraat is classified as primary road, category B, which means a main road.

- Around 8.00-8.30 AM, there is a peak of traffic moving in and out of the inner city. This peak goes down at 6.30-7.00 AM, 13.15-13.45 PM and after 17.30 PM. The remainder of the day shows a rather even distribution. The ESIA study area is mostly used to house several government departments and offices, with operating hours between 7:00-17:00. Therefore, the peak of traffic can be directly related to the operation hours of these government departments and offices in the area.
- Pedestrians were mostly observed during the morning peak 07:00-9:30 and in the afternoon peak of 15:00- 15:30. The study area is near several government agencies and offices with similar opening and closing hours, which explains the observed number of pedestrians. It should be noted that at the crossover in front Henck Arron straat 2-6 approximately 30 pedestrians were observed per half hour.
- Other observations of the traffic study include: the roads are generally in good condition, pedestrian facilities are minimal and not usable because of car parking along the road. The conditions of most of the footpaths are bad, because of loose tiles and bad drainage system. See **Figure 29** below. There are no speedbumps present in the study area.

Figure 29: Minimal pedestrian facilities and car parking alongside way/footpath of Kromme elleboogstraat (left) and loosetiles along the Waterkant footpath (right)

The details of the traffic study are included in Report Baseline Traffic Study report in Annex IIA

5.5 Parking

During weekdays at working hours, most streets of the inner city are lined by cars that park along the roads and on footpaths minimizing the walkability for pedestrians. There are some private and public parking lots but it is clear that available space is far from sufficient.

Chapter 4 mentioned the current number of available parking spaces in front of the selected historical buildings as well as the necessary number of parking spaces in the operational phase of the historical buildings. This implies that with the rehabilitation of the selected historical buildings a total of

approximately 130 parking lots need to be available elsewhere or alternatives for parking have to be sought for personnel and visitors.

Within the AII (radius of 500m) a total of 25 parking spaces have been identified (see figure below).

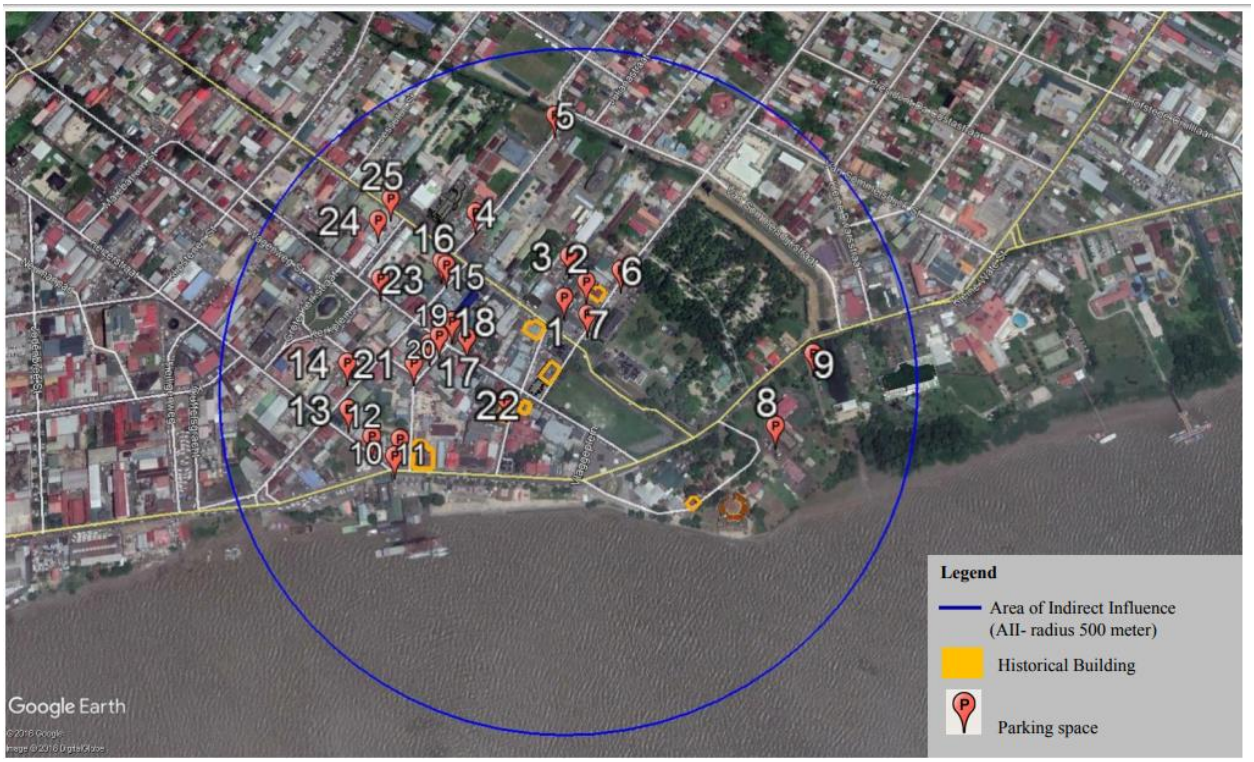

Figure 30: Identified parking spaces within the study area

Table below gives an overview of the 25 identified parking spaces.

Table 17: Locations identified parking spaces within the study area

No	Parking spaces
1	Parkinglot Ministry of Foreign Affairs on DNA terrain (± 15 spaces)
2	Public parking on DNA terrain (± 15 spaces)
3	Parkinglot Ministry of Foreign Affairs
4	Parkinglot/ Cathedral
5	Private parkinglot
6	Parkinglot at Palm garden in front of Sub district court
7	Parkinglot Presidential Palace
8	Parking Area (± 42 spaces)
9	Parking area (± 18 spaces)

10	Parking area (± 20 cars)
11	Parking area (± 15 cars)
12	Parking Area Kasimex
13	Parking Area Surinaamse Postspaar Bank (for clients)
14	Parking ara (± 30-40 cars)
15	Parking Area Surinaamsche Waterleiding Maatschappij
16	Private parking area
17	FHR Parking area
18	Parking Area (private)
19	Parking area (private)
20	Parking area
21	Parking area (Staff members Central Bank of Suriname)
22	Parking Area/Back entrance Central Bank of Suriname
23	Parking area Waldo's (private)
24	Fatum verzekeringsmaatschappij parking spaces
25	Digicel office parking spaces

5.6 Noise

As part of the baseline study, noise measurements were carried out. The methodology and detailed results are presented in a separate report Baseline Noise Report in Annex IIB.

Reference or baseline noise levels have been measured on specific time periods and at specific locations based on: (1)Traffic peak hours, which include morning peak hours between 6:30 AM and 9:30 AM and afternoon peak hours between 12:30 PM and 18:00 PM. The morning peak consists of one- time interval and the afternoon peak consists of two time intervals (IDOM, 2018). (2) The presence of important traffic routes for movement in the North-South direction. (3) The presence of sensitive receptors such as churches, restaurants and schools. (4) Operational hours of offices and workspaces during daytime. (5) The IFC requirements for measurements during daytime.

No nighttime measurements and weekend measurements are included as currently no nighttime/weekend project activities are foreseen.

In total four locations are selected for noise measurements (see Table and Figure):

- Henck Arronstraat– Grote Combeweg (N1)
- Onafhankelijkheidsplein – Kleine Waterstraat (N2)
- Mr.J.C.de Mirandastraat– Mr. F.H.R. Lim A Po straat (N3)
- Waterkant– Kromme Elleboogstraat (N4)

The noise measurements have been carried out during daytime (7.00-22.00h) on a weekday. At each location, 3 measurements were carried out of half an hour each, during 3 different time intervals. In total 12 measurements were carried out.

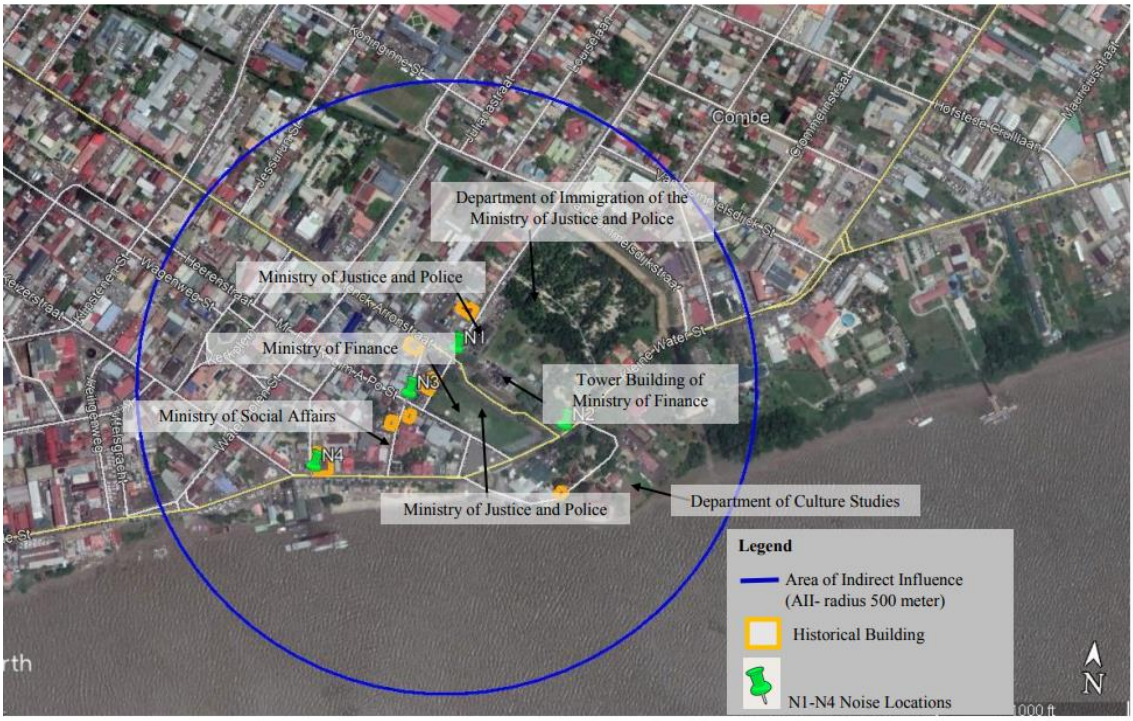

Figure 31: Overview of Noise Measurement Locations

The results of the noise study are summarized in **Table 18** below.

Table 18: Summary of daytime sound levels in the study area during the 3 time intervals

ID #	Location	Time period	Motorized traffic intensity	LAeq	L10	L50	L90	Lmax	Lmin
N1	At the junction of the Henck Arronstraat and the Grote Combeweg.	06:30-07:00 h	658	67.6	70.6	64.4	58.4	84.4	49.7
		12:30-13:00 h	848	68.5	69.0	63.0	56.5	100.2	48.4
		16:00-16:30 h	854	68.1	69.9	64.5	56.8	92.8	48.4
N2	At the junction of the Onafhankelijkheidsplein and the Kleine Waterstraat	07:15-07:45 h	849	72.5	75.1	71.0	64.4	92.5	52.3
		13:15-13:45 h	667	72.0	73.8	67.0	59.4	99.3	50.9
		16:45-17:15 h	866	71.6	74.7	69.1	62.8	92.5	53.3
N3	At the junction of Mr. J.C de Mirandastraat and Mr. F.H.R Lim A Po straat	08:00-08:30 h	400	63.7	66.8	60.1	55.0	85.8	49.2
		14:00-14:30 h	340	62.7	65.7	58.6	53.7	85.3	49.3
		17:30-18:00 h	229	60.7	62.7	55.1	50.1	84.4	44.1
N4	At the junction of the Kromme Elleboogstraat and Waterkant	09:00-09:30 h	497	69.3	72.3	66.4	57.6	89.7	47.7
		15:00-15:30 h	420	68.8	71.2	64.4	54.0	93.1	42.6
		18:15-18:45 h	390	70.2	73.0	67.1	58.2	92.6	48.3

Note: all values highlighted in red are above the applicable WHO/IFC daytime standard of 70 dBA for commercial areas

The noise levels for the different locations and time intervals are presented in **Figure 32**. In **Figure 33** the total traffic counts are set out as measured at the same locations and time intervals.

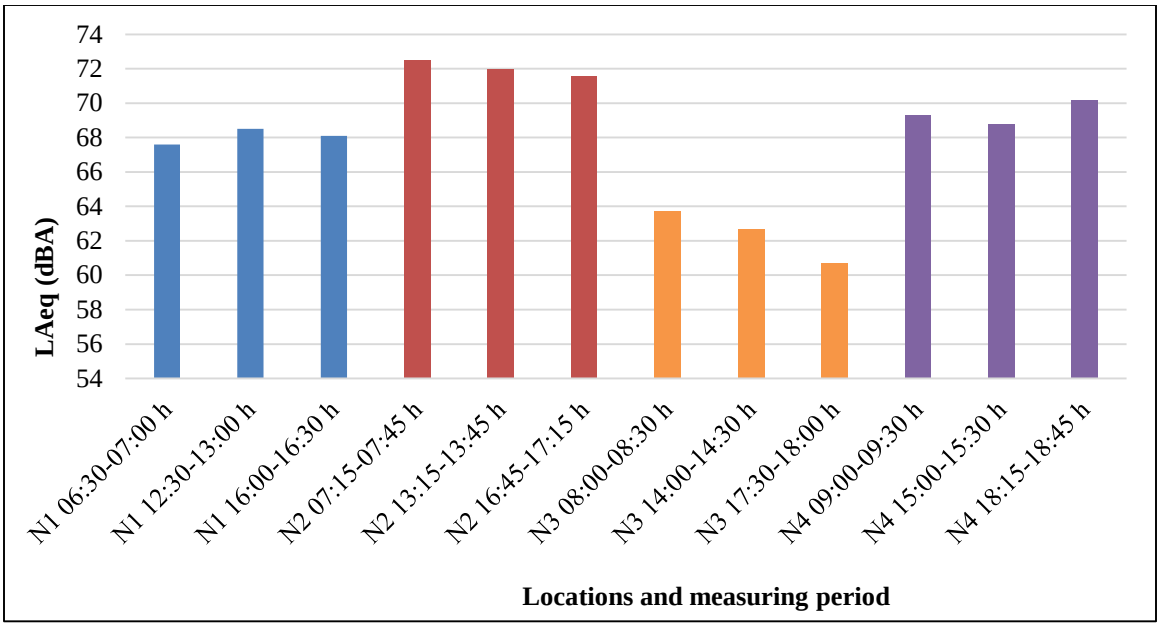

Figure 32: Noise levels at the locations during different time intervals

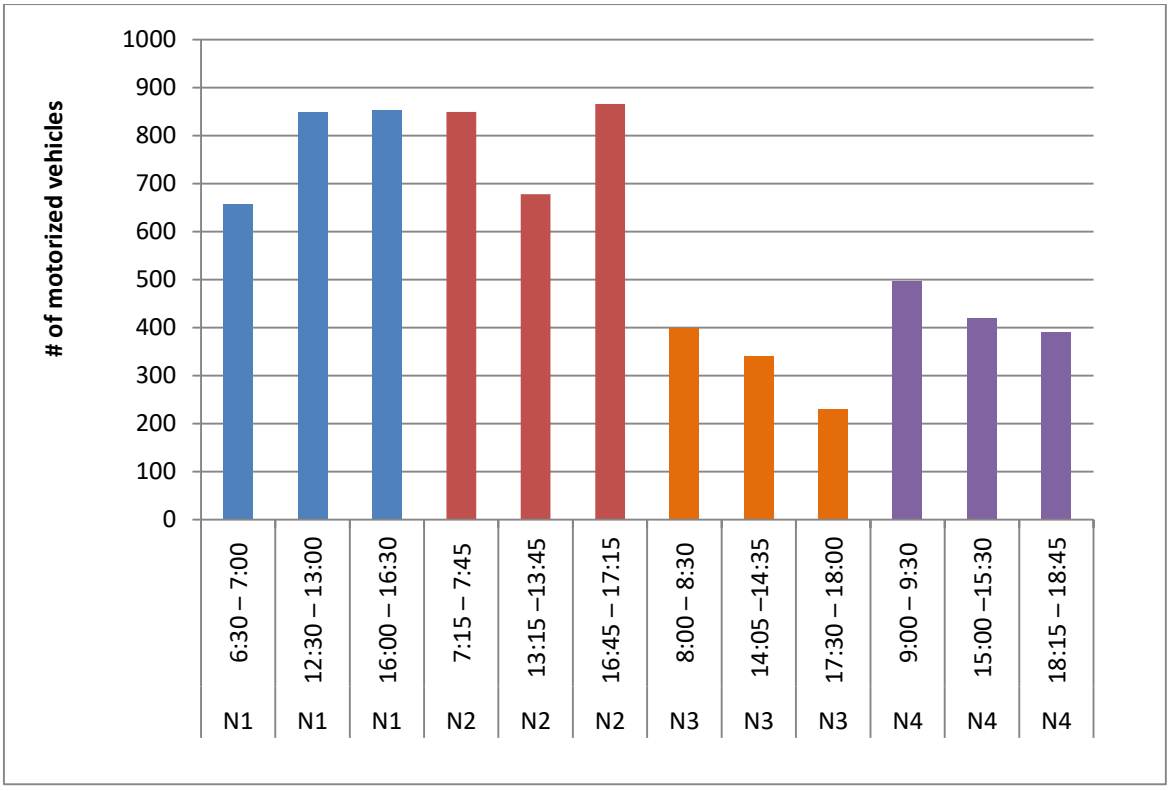

Figure 33: Total motorized vehicles at locations during different time intervals

In the absence of noise guidelines for Suriname the World Health Organization-WHO, World Bank/IFC) are used. **See Table 19** Applicable Outdoor Noise Standards for Community-based noise (WHO/IFC)

Table 19: Applicable Outdoor Noise Standards for Community-based noise (WHO/IFC)

	Maximum Allowable Ambient Noise Levels **1-hour LAeq (dBA)**	
Receptor	**Daytime 07:00- 22:00**	**Nighttime 22:00- 07:00**
Residential; institutional; educational	55	45
Industrial; commercial	70	70

The buildings in the project area are predominantly offices and other commercial buildings with operating hours between 7:00 – 17:00. Therefore, the standards for commercial area will be used to compare the measured noise levels. Where the baseline ambient noise level is above the standard, the variable permitted is no more than +3 dBA.

The main findings and conclusions of the noise study are:

- Most of the measured LAeq values are below the WHO/IFC daytime standard of 70 dBA for commercial areas. Only levels at location N2 (Onafhankelijkheidsplein- Kleine Waterstraat) and N4 during the last time interval (18.15-18.45) are slightly higher than the WHO/IFC limits. In general, the measured levels are considered representative for weekdays along the roads of the inner city of Paramaribo.
- The noise levels at N1 (Henck Arronstraat- Grote Combeweg) and N4 (Waterkant-Kromme Elleboogstraat) are almost similar, but the traffic intensity at N1 is much higher than at N4. This difference in noise levels is likely caused by:
    - The overall higher speed (and thus noise) at location N4, compared to N1.
    - The crossing at N1 causes traffic to slow down and thus standing and/or very slow speed levels. The Henck Arronstraat is narrowed with about 0.5 m at the junction with Grote Combeweg, so traffic is forced to slow down at this point.
    - N1 is situated in a more open space than N4 and reflections from the walls of buildings may result in higher noise levels.
- The noise levels at location N2 are higher than at N1, while the intensity of traffic is similar to N1. The higher noise levels are mostly caused by the overall higher speed level at N2 (see Traffic study report).
- Overall N3 (Mr.J.C.de Mirandastraat – Mr.F.H.R. Lim a Postraat) has the lowest noise levels. This location also has the lowest traffic intensity, while is also shows a good correlation between traffic intensity and noise level.
- In addition to the mentioned causes for differences in noise levels, also the type of pavement could play a role.

5.7 Land and Soils

The project area is located in the flat and low-lying Young Coastal Plain in an area with ridges (former beaches) and inter-ridge depressions of the Moleson phase. These sediments were deposited between

1300-2500 years ago. The ridges often consist of shells, shells fragments with or without sand and have their top at 3-4 meter above mean sealevel. The interridge depressions have variable textures ranging from clay to sand (with or without shells or shell fragments), but usually with sand in the subsoil.

The first settlement of Paramaribo was established at the site of the current study area. Fort Zeeland was built on the ridge on which the Henck Arronstraat was constructed and that ends at the Suriname River. During the early days of Paramaribo, the east-west streets were laid on ridges, while drainage canals were situated in the lower (also E-W running) interridge depressions.

So the Henck Arronstraat, the Mr. Lim A Po /Herenstraat and Keizerstraat all follow ridges. Soil maps are not available for Paramaribo, but most likely all these ridges are dominated by shells or shell fragments. Most of the soils in inner Paramaribo are disturbed usually as a result of cut (higher parts) and fill (lower parts). Various materials have been used as fill, including rubble.

5.8 Hydrology

5.8.1 Introduction

The main river in the area is the Suriname River. The river flow is controlled by the hydro power dam in Brokopondo, about 100 km to the south of Paramaribo. In the study area the Suriname River is wide and under tidal influence.

The study area is located in the Young Coastal Plain (low lying land) and as such prone to flooding. Suriname has experienced frequent floods in the past in the coastal plain and from rivers in the interior. The most recent severe floods were in the Interior in 2006 and 2008. Other less severe floods were experienced between 2010 and 2014. Floods may occur when sea/river level rises during tide, during tropical storms and rainfall- induced accumulation of water due to the outdated and insufficient drainage system.

5.8.2 Drainage

General

The proposed project buildings are located in the inner city of Paramaribo and mainly consists of build-up space. The buildings are located in the low lying young coastal plain as such prone to flooding.

The drainage system of historical Paramaribo consists of a combination of open channels and closed systems, which finally discharges into the Suriname River. Import drainage and sewerage system in Paramaribo include:

- Knuffelsgracht
- Viotte Creek
- Picornie Creek
- Steenbakkersgracht and the
- Sommelsdijckse Creek

The Sommelsdijckse Creek is the oldest drainage channel in Paramaribo and runs right through the old city. The drainage and sewerage of the inner city is regulated by sluices and pumping systems. The system collects both excess stormwater and wastewater from residential and public septic tanks, hospitals, and restaurants etc. which water is ultimately discharged into the Suriname River.

Due to urban development, the amount of water that is being discharged has increased, but the capacity of the system has not been enlarged. Open systems are not maintained well enough and are often visibly polluted causing stench and inconveniences during high water events.

Referring to Figure 37- Coastal flooding hazard map, it may be concluded that the historic buildings are located in a low flood hazard zone. As such, the risk related to the inner city being inundated due to heavy rainfall, high water events with blocked drainage system is low but in case this occurs it may cause inconvenience for travelers and visitors in the area.

Study area

Information about the drainage in the study area is gathered from the Civil Works Department of the Ministry of Public Works, Transportation and Communication (interview with Mr. Mohan, deputy director Civil Works, 12th September 2018). The drainage flow is described below and presented in Figure 30:

- The drainage water on the south side of the Henck Arronstraat flows directly to the Suriname River. The drainage system of the Keizerstraat located in the southern part of the Henck Arronstraat, crosses the Waterkant up to the terrain of the Scheepvaart Maatschappij Suriname (SMS) from where the outlet ends up in the Suriname River (Area 1).The drainage system of the Mirandastraat in this part crosses the Waterkant to end up in the Suriname River. In this part of the project area the area at Fort Zeelandia (Area 2) has its own drainage system that also leads to the Suriname River.
- The outlets at SMS Pier, Miranda Street and Fort Zeelandia are incorporated into the steel sheet piles. The diameter of the drainage pipes in the inner city varies between 30 and 40 cm.
- The drainage systems can be characterized as mixed system because in addition to rainwater, they also receive discharges of domestic waste water (partially treated by septic tanks).
- The drainage water of the north side of the Henck Arronstraat flows directly into the Sommelsdijckse Creek that dewaters to the Suriname River (Area 3). In the Sommelsdijckse Creek, the outflow is regulated via sluices and a pumping station near the Suriname River.

See figure below for the drainage and drainage pattern of the study area.

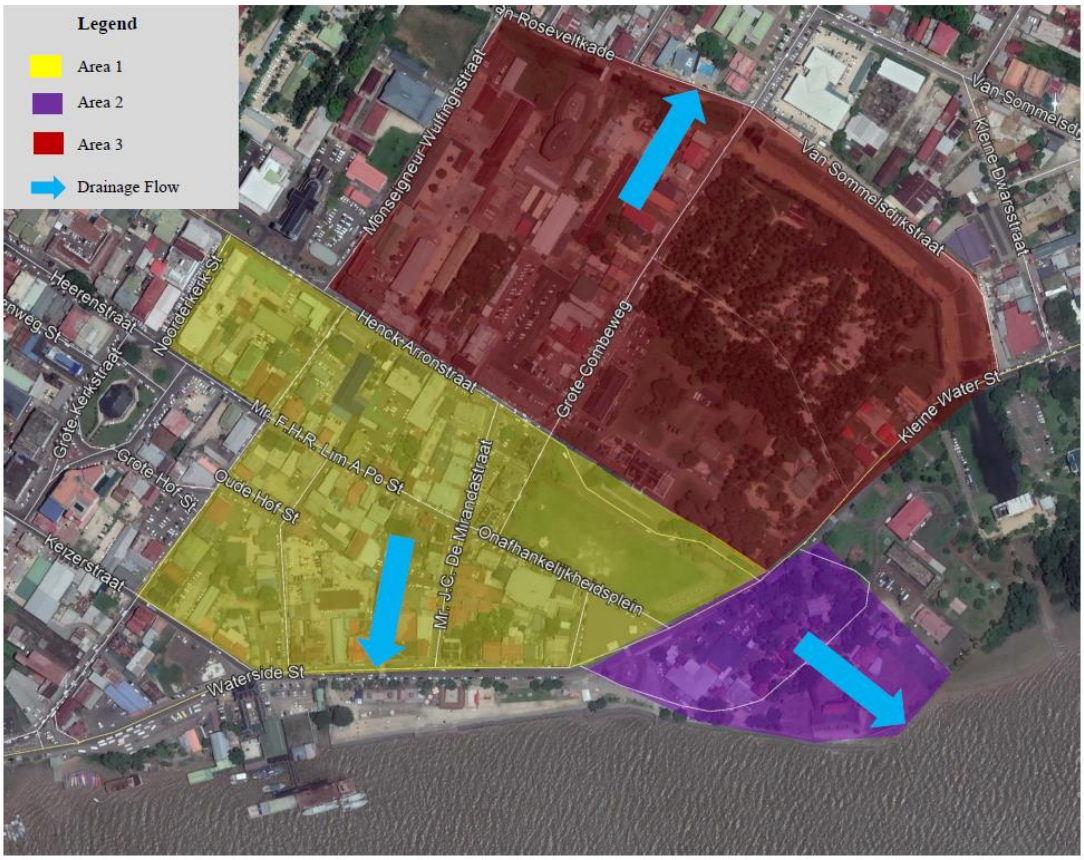

Figure 34: Drainage pattern study area

5.8.3 Water quality in the study area

The surface water observed in the study area were the van Sommelsdijckse Creek (man-made channel) and the Suriname River. As part of the baseline study, water quality in situ measurements were carried out. More information of the methodology is presented in a separate Water Quality Investigation Field Report in Annex IID.

Taking into consideration, the drainage system of the inner city of Paramaribo and the ESIA study area, water quality investigation in the van Sommelsdijckse Creek and Suriname River, has been proposed. In the van Sommelsdijckse Creek the investigation is done at four (4) locations, and in the Suriname River also at four (4) locations (see **Figure 35** and **Figure 36)**

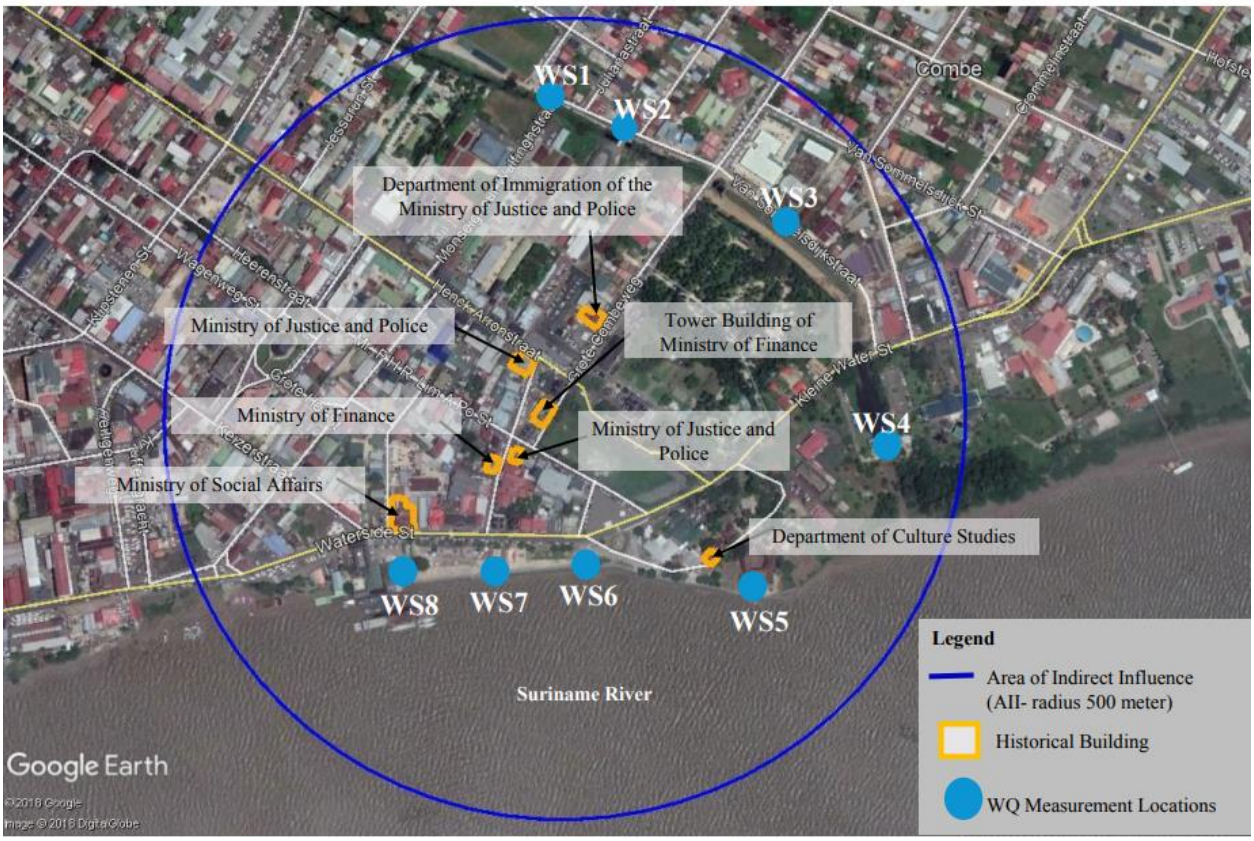

Figure 35: Overview of In-situ measurement Locations

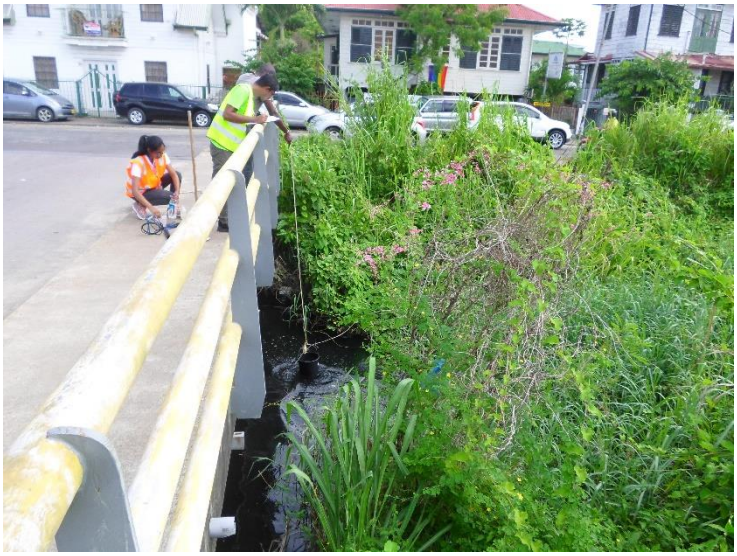

Figure 36: In-situ water measuring in the Van Sommelsdijckse Creek (left) and Suriname River (right), October 2nd 2018

The outcome of the investigations is also reported in the Water Quality Investigation Field Report in Annex IID.

The main conclusions of the investigation are:

- There is a difference in water color between the Van Sommelsdijckse Creek and the Suriname River. The Van Sommelsdijckse Creek also carries wastewater from houses and buildings. The Suriname River has a constant flow with lots of sediments transported.
- The EC of the Suriname River (measured during low tide) is higher than that of the Van Sommelsdijckse Creek. This is caused by the penetration of saltwater from the sea into the Suriname River. This can also be concluded from the higher measured salinity in the Suriname River. The Van Sommelsdijckse Creek is not in direct connection with the Suriname River.
- No flow of water was observed in the Van Sommelsdijckse Creek, while there is continuous flow of water in the Suriname River.
- No other significant observation was noted.

5.9 Specialist studies

5.9.1 Asbestos quick scan of the existing constructions

An asbestos quick scan of the structures and material present on the project buildings' sites was conducted by an asbestos expert in addition to the environmental specialist baseline studies, for reason of speculations that asbestos could be present in these structures and/or objects. The quick scan was limited to visual inspection. No lab testing on asbestos was done. Also no observations were done behind or in coves and shafts, hollow spaces between walls and floors, the drainage system and behind tile works.

The outcome of the asbestos inspection and methodology are reported in a separate Asbestos Reports attached in Annex IID-IIG to this report.

The main conclusions of the asbestos quick scan of the selected historical buildings are presented in Table below. The historical buildings that still need to be selected were excluded from Asbestos inspection.

Table 20: Overview main conclusions of the asbestos quick scan of the selected historical buildings

Project building, address	Inspection date	Main conclusions
Department of Immigration of the Ministry of Justice and Police Grote Combéweg 3	September 20th 2018	• The underside of the exterior of the building is finished with a bituminous layer, known as innertol, which could contain asbestos. Further examination of the material by means of sampling and testing is advised. • Inside of the ground floor no asbestos suspected material was encountered. • The glass of the windows is fastened with putty/kit in the wooden window frames. The kit could contain asbestos. Further examination of the material by means of sampling and testing is advised. • Inside of the first floor behind old fuse box a plate is found that may contain asbestos. Further examination of the material by means of sampling and testing is advised. • At the back side a stone structure consisting one building layer is attached to the building, which was closed at the time of the quick scan. As a result, the inside was excluded from the investigation.
Ministry of Justice and Police Henck Arron straat	September 21st 2018	• The stone structure attached to the proposed building on the side of the Henck Arron straat is not included in the quick scan. It is worth mentioning that the roof plates of this structure may contain asbestos and that this has to be taken into account during the restoration activities of the proposed building that is adjacent. • The glass of the windows is fastened with putty/kit in the wooden window frames. The kit could contain asbestos. Further examination of the material by means of sampling and testing is advised. • On the north and east side, the building has a balcony on the first floor that is not accessible due to safety reasons. • Inside of the ground floor no asbestos suspected material was encountered. In the electrical room old fuse boxes were observed with cords and plates that may contain asbestos. Further examination of the material by means of sampling and testing is advised. • Inside of the first floor no asbestos suspected material was encountered. • Inside of the top floor no asbestos suspected material was encountered.
Ministry of Justice and Police Mirandastraat 10	September 24th 2018	• The proposed building was entered via the stone structure which attaches the proposed building on the side of the Mr. F.H.R. Lim A Po straat to the adjacent building. This stone structure is not

		included in the quick can. However, a safe was encountered in this part, which may contain asbestos, so further examination of the material by means of sampling and testing is advised. • The glass of the windows is fastened with putty/kit in the wooden window frames. The kit could contain asbestos. Further examination of the material by means of sampling and testing is advised. • Inside of the ground floor no asbestos suspected material was encountered. • Inside of the first floor no asbestos suspected material was encountered. • The top floor is totally destroyed by the fire. No asbestos suspected material was encountered
Ministry Social Affairs Waterkant 32	September 28th 2018	• On the back side of the proposed building a structure of two building layers is attached to the proposed building • Inside of the ground floor no asbestos suspected material was encountered. The toilet rooms in the ground floor were excluded from the quick scan because they were closed at the time of the quick scan. • On the first floor in the electrical room old fuse boxes were observed with cords and plates that may contain asbestos. Further examination of the material by means of sampling and testing is advised. • On the top floor in the electrical room old fuse boxes were observed with cords and plates that may contain asbestos. Further examination of the material by means of sampling and testing is advised.

Because of the possibility of asbestos presence at the sites, it is recommended that specific measures as such asbestos handling and removal are included in the technical specifications of the project (contractor requirements) and in the HSE plan of the contractor.

5.10 Climate Change

Climate change projections include Sea Level Rise (SLR), changes in precipitation, changes in temperature and possible changes in the occurrence of extreme events including high wind speeds. All these projections are based on scenarios developed by the Intergovernmental Panel on Climate Change (IPCC) and adapted for Suriname to describe how future conditions may be developed considering the driving forces and key relationships. Climate change projections also illustrate a dynamic system with anticipated changes which could pose changes in the flooding hazards and risks. Figure 33 below shows a flooding map for Paramaribo as consequence of climate change under existing land use (Rawlings 2016).

As seen on the map below both the selected and still to be selected historical buildings for rehabilitation lie in the coastal land that is prone to floods.

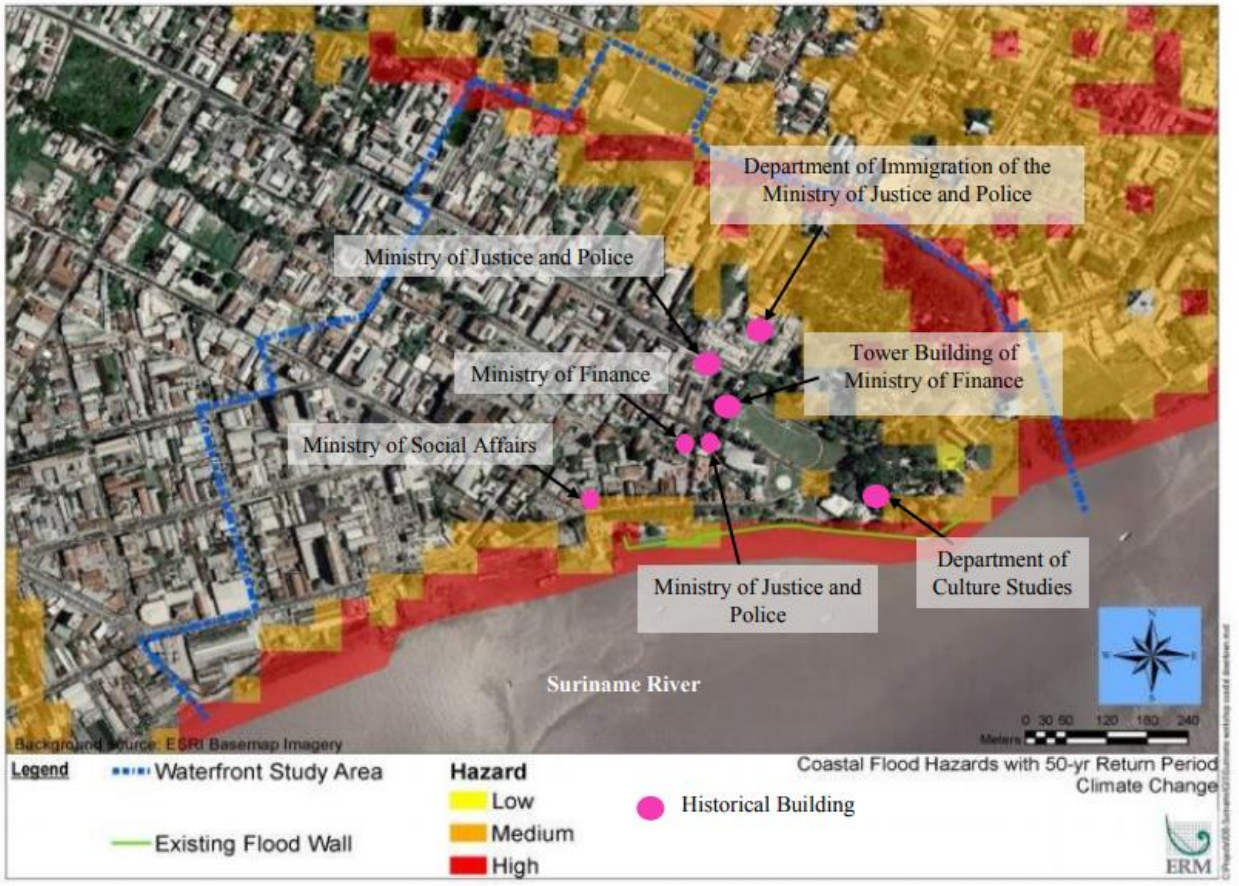

Figure 37 Coastal flooding hazard maps under existing land use and climate change (SLR +0.5 m) for 50-year return period (source: Environmental and Social Assessment for the Paramaribo Urban Revitalization Program 2016. Environmental Resources Management; Inter-American Development Bank, December 2016).

6 Socio-economic Baseline

6.1 Population Paramaribo Urban Area

The latest data indicate that the population of Paramaribo district is 240.924 (ABS, 2018[7]). Paramaribo is divided in 12 Resorts. The project is situated in Resort Centrum, where, 20.631 people (male: n = 9.835; female: n = 10.796) were counted. Table 21 shows the distribution of the age categories by gender.

Table 21: Distribution population Paramaribo Center

	Gender	
Age category	male	female
0 - 4	708	659
5- 9	670	592
10 - 14	745	796
15 - 19	901	829
20 - 24	864	917
25 - 29	831	842
30 - 34	683	747
35 - 39	564	643
40 - 44	610	721
45 - 49	651	670
50 - 54	603	728
55 - 59	492	524
60 - 64	405	536
65 - 69	354	396
70 - 74	250	321
75 - 79	209	358
80 - 84	137	247
85+	126	242
unknown	32	28
Total	9.835	10.796
Acquired from ABS 2014		

The General Bureau of Statistics (ABS) distinguishes the main ethnicities (i.e. largest populations) of the district of Paramaribo as: Creole (26%); Hindustani (23%), Mixed (18%); Maroon (16%), Javanese (10%) (ABS, 2014). According to ABS data (2014) the highest completed formal education is most often secondary school (VOJ: 34%) or primary school (GLO: 27%). Of the economic active population, most work for the Government (15%) and in the trade sector (14%).

[7] ABS. (2018). Statistical Yearbook 2016/2017 Suriname. ABS: Paramaribo

6.2 Sensitive Receptors

6.2.1 Introduction

Sensitive receptors are people or other organisms that may have a significantly increased sensitivity or exposure to contaminants by virtue of their age and health (e.g. schools, day care centers, hospitals, nursing homes), status (e.g. sensitive or endangered species), proximity to the contamination, dwelling construction (e.g. basement), or the facilities they use (e.g. water supply well).

6.2.2 Social Places

Five so called social places were identified in the ADIs. For the purpose of this study, places are considered to be *social* when they are open for public and have recreational value; i.e. people visit these places for relaxation and/or gatherings. The following social places are distinguished:

- Palm Tree Garden: this public park is adjacent to the Presidential Palace and is under supervision of the President's Cabinet. The Palm Tree Garden is named after the prominent palm trees. In this park several statues are present as well as a playground. This park is commonly used during national holidays for festivities and commerce. Also, during the year private organizations organize activities for the community. The household at Combéweg #1, across from the Palm Tree Garden, earns some extra money during the festivals and other activities by guarding parked vehicles. The Palm Tree Garden is also popular by tourists as it represents the history of the Colonial Area.

Figure 38 Festivities and commerce Palm Tree Garden during Day of the Maroons (Dag der Marrons) 2018

- Congress Hall: this building is let for diverse - more formal - purposes. Both public and private organizations may request the Secretary Office of the President's Cabinet to rent the place. Events take place throughout the year. The Congress Hall is located in a one way street, with few parking spaces. Situated in front of the Congress Hall is the Independence Square.

- Independence Square (*Onafhankelijkheidsplein*): This open space is located between the Presidential Palace and Congress Hall, houses two statues and is decorated with several country flags (Flag Square/Vlaggenplein). During the year the Independence Square is used for diverse events, from placing the national Christmas Tree to dance events. The National Assembly is located next to the Flag Square. Protest manifestations are occasionally organized across from this building.

- Fort Zeelandia area: The area is very popular by local residents and tourists, both for its historical value and because ofthe nice view. People visit the former Dutch fortress, or stroll through the surrounding area. There are also several benches in the shadow for visitors to relax. In the Fort Zeelandia area the "*I love Suriname*" sign is very popular to take pictures. Although the area can be reached by car, the streets are very narrow and there is a lack of parking spaces. Via the Zeelandiaweg the Waterfront promenade can be reached by foot.

- Waterfront (*Waterkant*): this promenade along the Suriname River is popular among both local residents and tourists. The Waterfront promenade has a playground, a crafts market, and several eateries. Also some street vendors sell their products (crafts/refreshments). Elderly men may gather here in day time, and the evening mainly young people and love couples visit the place. The presence of homeless people, and drugs use and trade have been reported as a social problem in this area. The Waterfront is adjacent to a busy street (at daytime) and has parking spaces along the promenade. The District Commissioner of Paramaribo has established a Waterfront Management Council, which maintains a small office on Waterfront itself. This council is responsible for the management of the Waterfront area and has the task is to ensure that the relevant rules and regulations are observed[8].

6.2.3 Educational Institutions

In the total ADI four educational institutions are identified (See Figure 39). Day-care ('t Buzaantje) is located at the property in front of the Ministry of Foreign Affairs (ADI Grote Combéweg #3). Because the building of 't Buzaantje is very small, only children of employers (with a maximum of 10 children) of this ministry are admitted. The FHR Institute (higher education) is located in the ADI of the buildings at Henck Arronstraat #1, De Mirandastraat #5, #7 and #10, and Tamarindelaan #3. Two art & culture educational institutes (higher education) are identified; one in the ADI of De Mirandastraat #5 & #7 and one in the ADI of Zeelandiaweg #3.

[8] Culturecom Consulting (Red.). (2016). *Livelihoods Assessment and Plan for Waterfront development and bus terminal improvement.*

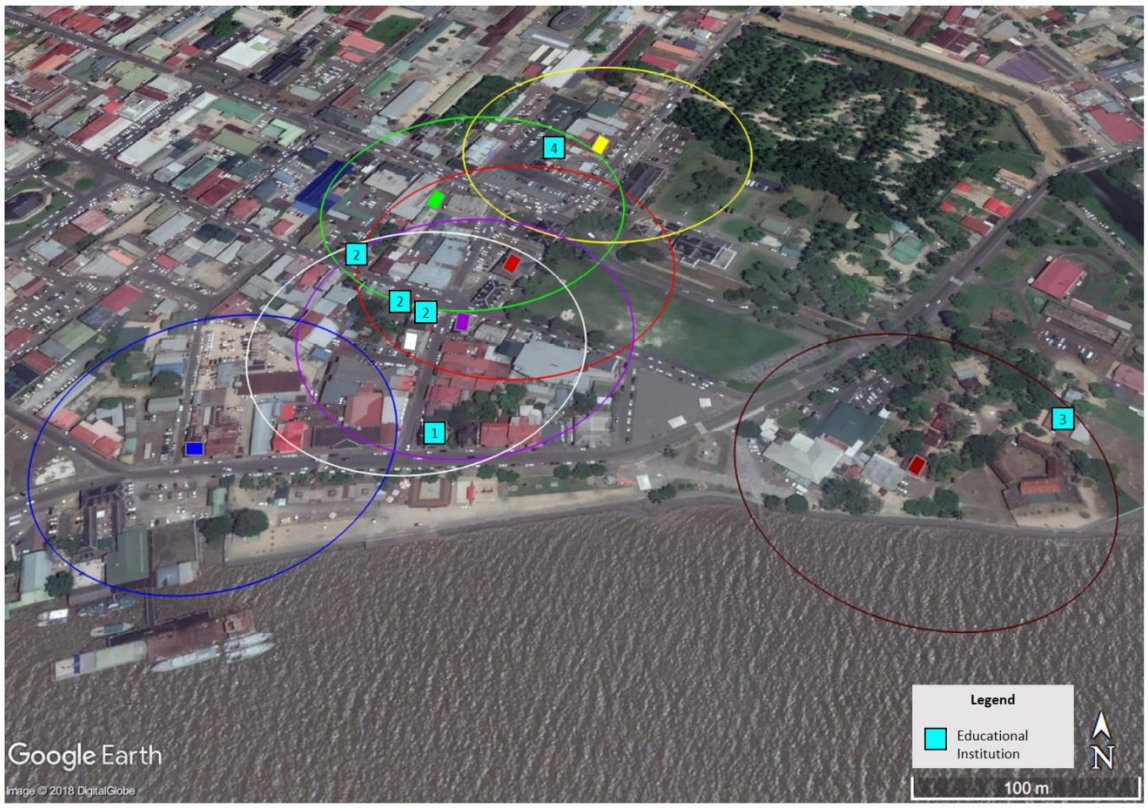

Figure 39: Overview of educational institutions

6.2.4 Residents

In total ten households were identified in de ADIs of the seven selected historic buildings (See Figure 40). These households are located at Henck Arronstraat (n = 1), Grote Combéweg (n = 1), Lim A Postraat (n = 1), Mr. J.C. De Mirandastraat (n = 2) and Waterkant (n = 5). For the purpose of identifying any persons with valid claims to involuntary resettlement or loss of livelihoods as a result of the project, the date at the end of the social-economic baseline (30th November 2018) is considered the cut-off date. The results regarding the households are described below.

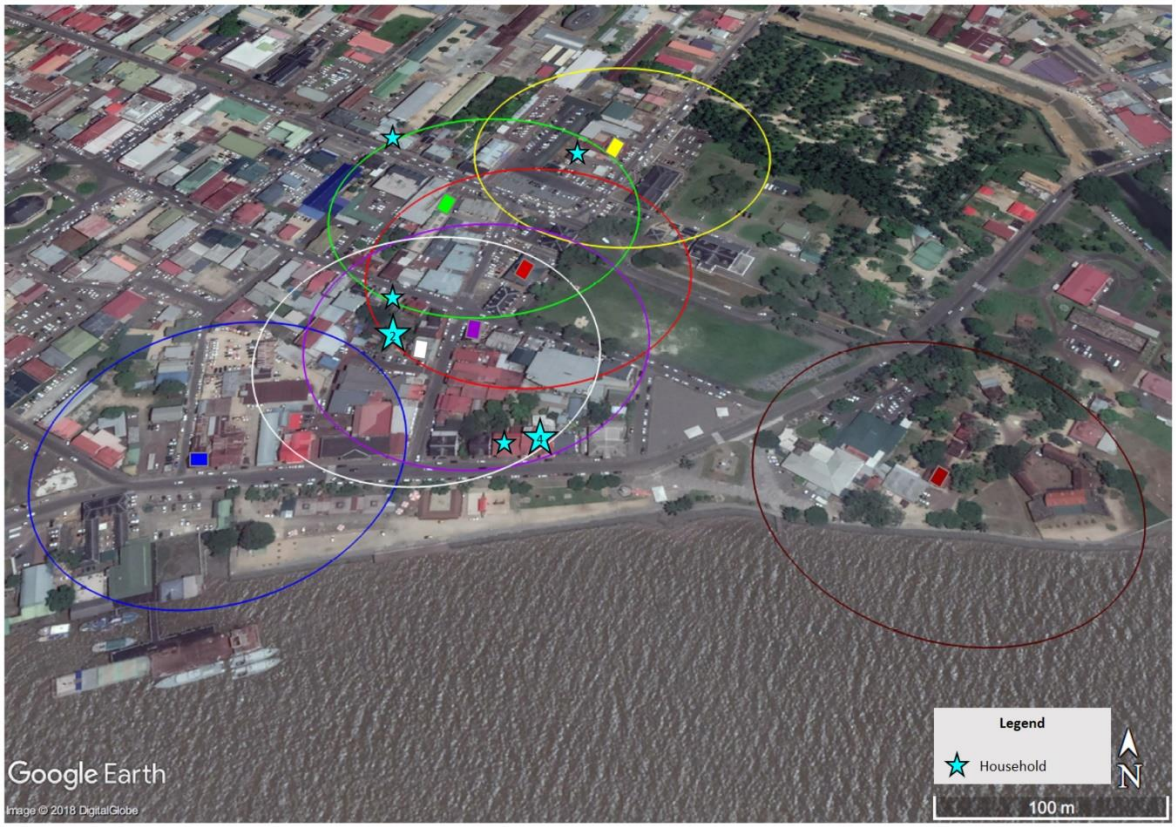

Figure 40: Overview of households

ADI Combeweg #3

In the ADI of Grote Combéweg #3 (**Figure 41**) lives one Creole male person (CH) who is 57 years of age. His highest completed education is elementary school and he speaks fluently Dutch. The main source of income for CH is guarding the parking lot adjacent to the project site. At times he also washes cars. With these activities CH earns about USD 133,- to 266,- [9] per month. With the money he earns, CH takes care for his spouse, who has two children. She and her children live in another part of Paramaribo (Boma area). According to CH, his monthly expenditures are about USD 57,-. At the time of the interview, CH had no disease or disability and he did not have health insurance (or any other kind of insurance). CH has lived in the dwelling (**Figure 42**) since 1992. His father was concierge of the Parliament Building and was therefore allowed to stay at the dwelling, which was spared during the 1996 fire. When his father passed away two years later, the family (mother, CH and siblings) continued living there. At this moment, CH is the only person from his family still living in the dwelling. As his father, CH does not rent the place, but stays there for free. CH is formally registered at the Central Population Registry (CBB: Centraa Bureau voor Burgerzaken). The excerpt of this registry states that CH is registered at the address since 1987 (Annex IVC). CH's main source of drinking water is from a SWM tap in the yard and he has no access to electricity.

[9] Based on 2018 USD rate 1:7.5

Figure 41: Orientation dwelling with respect to the most nearby project site (Grote Combéweg #3)

Figure 42: Dwelling Grote Combéweg #1

ADI Mr. J.C. De Mirandastraat # 5-7

In the ADI of Mr. J.C. De Mirandastraat # 5-7 (Ministry of Finance); on the lot behind the building of De Mirandastraat #7 live two households. The dwelling can only be reached by a corridor which is closed by a door. Both households live in the same dwelling. See figure below.

Figure 43: Dwelling Mr. J.C. De Mirandastraat #7

Household #1

This household consists of mother (47) and daughter (5). The mother is a government worker and earns about USD 400[10]. She estimates her monthly expenditures at USD 85. The daughter goes to elementary school. Both mother and daughter are in good health and have a basic health insurance.

Household #2

This household consists of a mother (41, sister of mother of household 1), father (30+), daughter (22) and son (13). The mother of this household works for the government as a cleaning lady. The father works at an automotive shop/workplace. Their monthly earnings and expenditures are unknown. Based on the work description it can be assumed that mother and father have low incomes. Both children go to school daily. Both parents are hearing impaired.

According to the mother (in household #1) the house they live in belongs neither to the state of Suriname nor to a private party (sui generis). Their mother was allowed to live there as she has been concierge of several ministries (amongst others Ministry of Finance)[11]. After their mother passed away the children stayed in the house. They don't pay rent, but stay there for free. The mother has been living there since birth, which is documented at the central population registry (Centraal Bureau voor Burgerzaken, CBB). They do have SWM water in the house, as well as EBS electricity 24/7.

[10] Based on 2018 USD rate 1:7.5
[11] Further investigation about the ownership of the house is pending.

Other Locations

Furthermore, households living at Henck Arronstraat #12 (the Bishop of Paramaribo), Lim A Postraat #3 (family Lim A Po) and Waterkant #10 (editor in chief of De West newspaper). The Verenigde Surinaamse Holdingmij (VSH United) owns the twin building at Waterkant #6 & #8 and housed, at the moment of the data collection (September 2018), four households in separate apartments. Limited information was collected due to non-response although several attempts have been made (also see Annex IVD). The table below shows an overview of the known owners of the household buildings including known household members.

Table 22 Overview owners' household buildings

		Owner building	No. of households	No. of household members
1	Grote Combéweg # 1	State of Suriname	1	1
2	Henck Arronstraat #10	Roman Catholic Church	1	1
4	Waterkant #6 & #8	VSH United	4	8
5	Waterkant #10	Private owner	1	3
6	Lim A Postraat #3	Private owner	1	2
7	De Mirandastraat #7	State of Suriname	2	6
		total	10	21

6.2.5 Vulnerable populations

Observations and stakeholder interviews revealed that several vulnerable groups can be identified in or near the ADI:

People with disabilities

In one of the households at Mirandastraat #7, two persons –a couple- are hearing impaired. Despite their disability, they are able to work and take care of their family (i.e. running the household).

Low-income families

Among the 10 households in the ADI, two can be classified as low-income families, one at Combéweg #1 and one at Mr. J.C. De Mirandastraat #7. The household heads work either low-paying or informal jobs. The resident at Combéweg #1 has no health insurance, no access to electricity and no running water in the home.

School-aged children

In one of the households at the Mirandastraat #7 live two children of 5 and 13 years of age. Both children attend school. In none of the other households in the ADI, residing children were reported.

Homeless people

Within the ADIs of the seven selected historic buildings, several locations are the "territory" of homeless people (men). In the evening they sleep at the staircases of the buildings. Neighborhood residents complained about the nuisance the homeless cause; stealing, yelling and even threatening. Most nuisance is experienced in the Grote Combéweg, Mr. J.C. de Mirandastraat and Waterkant. As a result of the analysis no homeless people live or squat at the selected buildings (i.e. Grote Combéweg, Mr. J.C. de Mirandastraat and Waterkant). The District Commissioner of Paramaribo Mr. Grando indicated that, if the construction activities of the selected historical buildings hinder the homeless, they will shift to another part of the city (pers. com. 26th September 2018).

Indigenous Peoples and Maroons

According to the Indigenous Platform in Unity and Solidarity for Alliance and Progress (Eenheid Solidariteit Alliantie en Vooruitgang), ESAV[12] the Palm Tree Garden is a sacred place for the indigenous people[13]. The lands surrounding the Palm Tree Garden (the historic palm garden in Paramaribo) are regarded as the home of the first Indigenous people of Suriname. This area is currently not considered as part of the customary lands of any one of Suriname's existing Indigenous or Tribal ethnic groups. No Indigenous People live or have permanent businesses on this location. Construction-related activities will not take place in the palm garden.

6.3 Livelihood Significance of the project sites

In the ADIs several sources of livelihood are identified. The buildings of Henck Arronstraat #1 (owned by the ministry of Justice and Police) and Tamarindelaan #3 (owned by the ministry of Finance) still function as governmental offices (Table 22 Overview owners' household buildings)

The building of Zeelandiaweg #3 functions as an exhibition place and is opened on workdays. The remaining buildings are empty (i.e. don't have a function), but are adjacent to buildings with different functions (i.e. offices, restaurant, guesthouse and educational institution; See Figures 3,4,5,6 in *section 4.3.2.).*

The various business and government offices in the ADI are listed below. It should be considered that construction activities may influence productivity and/or earnings.

6.3.1 Businesses and non-government offices

In the seven distinguished ADIs a total of 33 businesses and offices are identified (see Figure 44). Most are located in the ADI of Waterkant #32 and can be classified as retail trade venues. These venues are primarily located in the area of the Waterside promenade and are further distinguished as retail sale via stalls of food, beverages and tobacco products (ISIC[14] 4781; n_{max} = 18[15]) and street vendors (ISIC 4799; n = 3).

[12] A platform with the objective to represent the Indigenous people by protecting and maintaining their culture (http://www.esav.network/)
[13] Source: http://dagbladdewest.com/2015/01/21/esav-nieuw-platform-voor-inheemsen/
[14] This code corresponds with the classification of the activities according to the ISIC.
[15] For the purpose of this study, the food stalls of the Waterfront Food Court are counted as one.

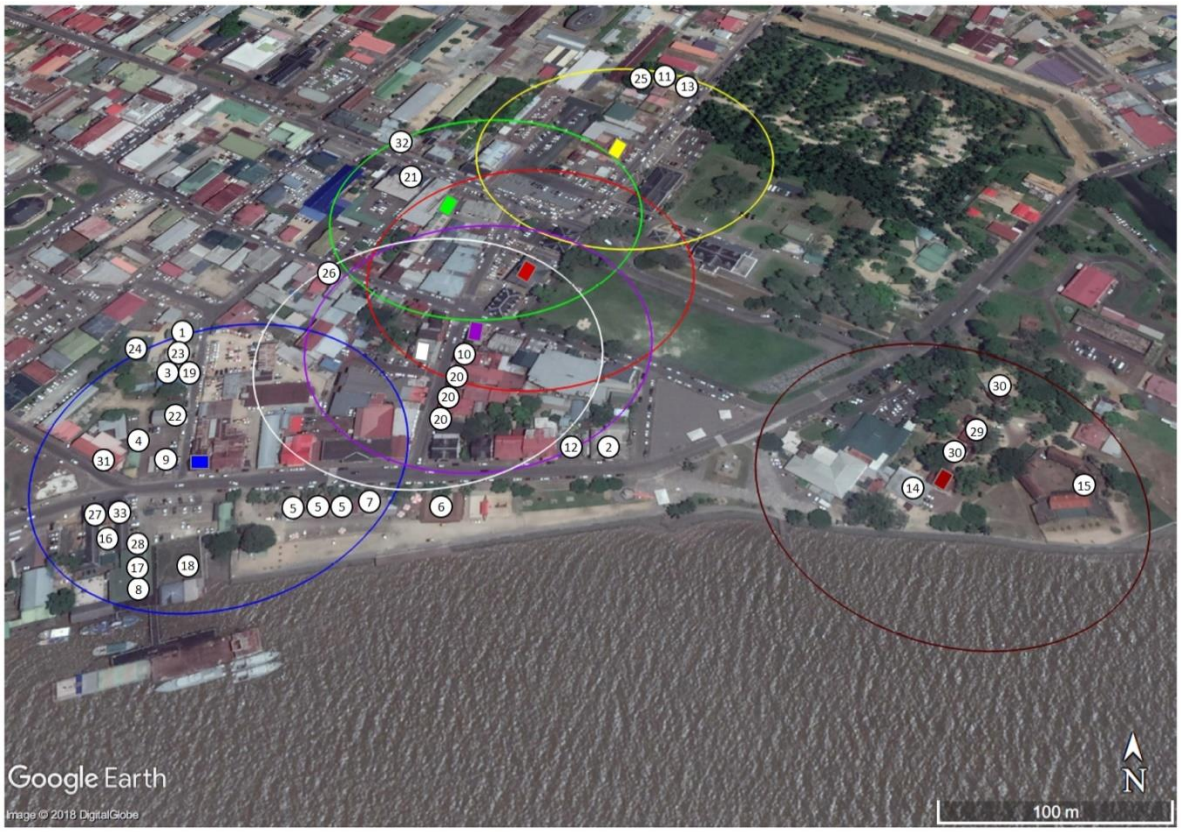

Figure 44: Overview of businesses and non-government offices

The manufacturing company *Bakajari* is also located in the project area of Waterkant #32. This company is part of *De Waag* restaurant which is located in this project area as well. Across *De Waag* is a paid parking area. The second restaurant this project side houses is *JiJi's Restaurant*, which is located on the top floor of the building of SMS. The SMS is a so called inland passenger water transportation organization, which has a shipping service boat and sails every Friday's and Sunday's. The dock of SMS is also used by other companies that arrange private boat trips. Next to the SMS is the Waterfront promenade located. As written earlier, along this popular promenade are several eateries and a crafts market (just outside of the project area border).

On the east side of the Waterfront promenade is the project side of Zeelandiaweg #3 located. In this area the restaurants *De Gadrie* and *Baka Foto* are established. Also the Foundation Suriname Museum (ISIC 9102) and Foundation Built Heritage (ISIC 9102) can be found here.

At the border of project side De Mirandastraat #5 is guesthouse *La Petite Maison* situated. Across the street from project side De Mirandastraat #5 is a newspaper publisher (*De West*) located. *De West* owns the buildings at #2, #4 and #6. At De Mirandastraat #8 guesthouse *De Kleine History* is located, which is right next to the project side of De Mirandastraat #10. Another guesthouse (*Albergo Alberga*) is located at the border of project side De Mirandastraat #10. Although the accommodation venues are opened through the year, high season for this category is typically in the months July, August and December.

The restaurant & guesthouse *Zus & Zo* and the bicycle renting company *Fietsen in Suriname* are located in the project area of Grote Combéweg #3. Mainly tourists and interns visit these places.

In the ADI of Henck Arronstraat #1 the following categories of offices are identified; insurance company (ISIC 6512; n = 1), consultancy firms (ISIC 6202, n = 1; ISIC 7020, n = 1) and a department of the Catholic Church (ISIC 9491, n = 1).

According to the standards of the International Labour Organization (ILO) most of the venues (n = 23) are micro businesses (1 to 10 employees). At the moment of data collection (September 10th – 26th, 2018) none of the venues had planned special activities for 2019.

6.3.2 Government Offices

In total 17 government offices, located in different buildings, are identified (see figure 45). One of these is a parastatal company, namely the Suriname Water Company (SWM). The government offices and parastatal office are opened Monday through Friday from 7am to 3pm.

Most employees come to work by car. For the offices with private parking lots, parking is no issue. However, most offices do not feature private parking. For employees of these offices parking is a challenge. Also, respondents complained about the lack of parking possibilities for their guests/visitors. Other mentioned commuter transportation includes bus, moped and the ferry (for the residents of Commewijne district). At the moment of data collection, no special activities were planned.

Figure 45: Overview of government offices

6.4 Archaeological Resources, Tangible Heritage, and other Places of Cultural Significance

6.4.1 Cultural heritage sites

The ADI and the broader impact area feature various structures and locations that belong to tangible heritage, including historic buildings[16] (n = 62), statutes and monuments (see Figure 46). Also it is not expected that the Project will have adverse effects on tangible cultural heritage.

Figure 46: Overview of cultural heritage sites

6.4.2 Archaeological sites

The national register of cultural heritage sites (Versteeg, 2003) identifies Waterkant and Mirandastraat as archaeological sites in the ADI. These sites may contain tangible heritage finds from pre-Columbian Indigenous cultures. There is a significant chance that archaeological findings are revealed if it is needed to dig deep during the construction activities (I. Meulenberg, personal communication, September 27th, 2018). It must be taken into account that lack of national register status does not mean that more sites do not exist in the project footprint, as few places have been excavated.

Given the absence of Suriname national guidelines in the case of archaeological finds, any direct Project activities and activities indirectly resulting from the Project activities in the longer run, should be

[16]Monumentenlijst Paramaribo (n.d.). Retrieved October 4, 2018, from https://citofparamaribo.nl/?file=32986 (updated by author)

consistent with internationally recognized good practice as described in the ICOMOS (1990) Charter for the Protection and Management of the Archaeological Heritage. In addition, Project stakeholders must comply with the Government of Suriname (GoS) Monument Law of 2002 for immoveable archaeological resources found during the course of the project.

Article 20.1 stipulates that monuments found in excavations and on which no one can prove the right of ownership are owned by the state. 2. The owner of the land in which the monuments have been dug up is required to transfer the found monuments to the State and is entitled to a reimbursement amounting to half the value of those monuments. 3. Monuments found in an investigation…may be transferred to a place suitable for their custody on the instructions of the Minister [of Education, Science and Culture].

Article 21. States that the finder, within thirty working days after the discovery must indicate the exact location, time, monument and particulars of the discovery to the District Commissioner (DC) of the district in which the discovery has been made who shall immediately notify the Minister.

National guidelines are still in review phase by the government Directorate of Culture of the MINOWC and are not available for distribution.

7 Public Consultation

Public consultation is a key component that runs throughout the ESIA process. During the first phase of the process, key stakeholders are identified and consulted.

The study started on August 6th of 2018, with the official Contract Signing. A kick-off meeting with the Project Implementation Unit of URP (PIU-PURP) was held on the 15th of August 2018. A site visit was conducted on the 20th of August 2018. With the Design Consultant KDV Architects meetings were held on the 23rd of August and on the 11th of September 2018 and with the Design Woei-A-Sioe Architects and Partners N.V. on the 11th of September 2018. Also, on the 23rd of August 2018 a meeting was held with NIMOS about the approach and methodology as well as the additional concerns to be included in the study.

In all the initial meetings, preliminary ESIA findings (potential issues and impacts the proposed project may have) were discussed. All minutes of meetings are included in Annex III

In order to further identify potential issues and impacts it was decided that key stakeholders would be consulted during the Scoping Phase. The Consultant organized a Scoping meeting on the 24th of August 2018. This was the first public consultation meeting where the content of the proposed project and the already identified potential issues and impacts regarding the project was presented to the invited key stakeholders. During this consultation the stakeholders raised other concerns and potential impacts to be included in the ESIA study.

During the ESIA process a meeting was held with the Ministry of Justice and Police, Ministry of Cultural Studies and Ministry of Foreign affairs. These meetings were respectively held on the 19th of September, 15th of October and 18th of October 2018.The minutes of these meetings are included in Annex III-H, III-J, and IIIK)

Further consultation of stakeholder consultations/interviews was undertaken to inform persons and organizations with special interest in the Area of Influence about the projected construction activities, and to elicit their concerns and suggestions to minimize negative project impacts and maximize project benefits. Consultation meetings took place in the period September 10th to 28th 2018. In the list of consulted stakeholders in the ESIA Phase that is attached to this report in Annex IVA is presented for each consulted stakeholder group their function in the AoI, their main concerns and proposed mitigation actions. Gathered concerns and proposed mitigation measures also were used to inform the assessment of social impacts.

The minutes of meetings have been added to this report as well in Annex III

The second Public Consultation will be held February 2019 after this document is submitted to NIMOS for review. In this second Consultation Meeting the Environmental and Social Baseline conditions together with the Impacts Assessment of the proposed projected from this document (see Chapter 8) will be presented to the stakeholders. The comments of the stakeholders and NIMOS will be processed in this document to complete the final ESIA report for the Rehabilitation and Operation of Historical Buildings.

8 Potential Impacts and Proposed Mitigation Measures

8.1 Introduction

Tables 23 to 26 summarize the kind of environmental and social impacts that can result from the rehabilitation and operation of the selected Historical Buildings. In the context of these potential impacts, the environmental and social conditions were assessed to determine the potential risks for the project.

Additional impacts specifically for a building are discussed separately.

8.2 Noise and Dust

All surrounding buildings of the selected historical buildings are currently occupied. During the rehabilitation works there will be noise and dust nuisance. It is advised to:

- Start construction works mainly from the inside of the buildings.
- Prior communication about noisy and dust producing activities with neighbors so that windows can be kept closed to minimize nuisance.
- Noise: plan specific noisy construction activities before and after office hours, have a prior communication about noisy construction activities with neighbors.
- Dust: place dust screens, prevent dust emissions by covering and wetting of dust producing material during rehabilitation activities.

8.3 Parking

During the rehabilitation of the selected historical buildings, parking near these buildings isn't possible. About 20-30 parking spots will become less available nearby and in front of these buildings.

During the construction phase it is advised to:

- Use of alternative parking places in the surroundings: A total of 25 parking spaces (public and private) are identified in the near surrounding, also see section 5.5 of the environmental baseline. It is recommended to negotiate with owners of private parking areas for temporary use of their spaces during daytime during the construction. For example, private paid parking across the gas service station at the corner of the Wilhelminastraat and the Van Sommelsdijckstraat is reportedly available during daytime.
- Use of busses for transport of construction workers to the site.

This will temporarily solve the parking issue but the impact is still considered moderate for the longer term because about 130 parking places will be needed additionally during operations. Long-term recommendations are included in the mitigation tables below.

8.4 Traffic

The project sites are located in the historic inner city. Most important roads to divert traffic through the city in the North-South Direction are located along the project sites. See also section 5.4 of the environmental baseline. During the rehabilitation of the buildings, it is expected that extra traffic congestions may occur, especially during peak hours and certain construction activities adjacent to the roads.

Therefore, during rehabilitation activities it is advised to:

- Introduce alternative routes for both destination and other traffic especially during peak hours and certain construction activities. Signs have to be placed at strategic locations, so that the public is informed well in advance.
- Re-direct heavy traffic.
- Allow the Contractor to use heavy equipment only during non-peak hours. E.g. supply of material can be in the weekend or after 3 PM.
- Have a traffic management plan in place in close cooperation with the traffic police.

These items can be included in the Contractor's activity (works contract).

Other specific impacts of the project include:

- Theft of goods of the project by homeless (major)
- Risks of fire during construction period (due to outdated electricity networks) (major)
- In the ADI of the historical buildings sites several businesses (restaurants, guesthouses etc.) are observed which may be affected by the project activities. This may be negative: as such have a decrease/loss of visitors and customers and/or positive as such gave an increase in visitors/customers.

For the household at the Mr. J.C. De Mirandastraat 7 (Building of Ministry of Finance, not yet selected), there is one specific impact to be addressed in case the building will be selected for rehabilitation:

- Temporary loss of home which would require the development of a Resettlement Action Plan (RAP)

Table 23: Potential environmental impacts during the construction phase of the selected historical buildings, their source and mitigation

Construction Phase , applicable for all selected buildings						
Environmental Aspects						
Affected Environmental Aspect	**Impact Description**	**Impact Likelihood**	**Impact Characteristics and Consequence**	**Impact Significance**	**Mitigation Measures**	**Residual Impact**
Visual and Aesthetics	Transportation, supply and handling of materials: storage	Very likely	Direct; short term, reversible. Consequence: minor	Low	Limited operational hours (e.g. only daytime). Maintenance of vehicles and wetting, covering of construction site Prevent obstruction of access routes/emergency escapes by proper storage of materials. Materials to be properly stacked to prevent falls. HSE guidelines for contractor (toolbox meetings for workers) Include specific removal procedures for asbestos/hire an asbestos specialist for removal asbestos	Negligible
	Temporary fencing and delineation of working area: physical presence	Very likely	Direct, short term, reversible Consequence: moderate	Medium	Media announcement, proper signing	Low
	Waste: waste from construction activities	Very likely	Direct, short term, reversible Consequence: minor	Low	The contractor should have a waste management plan in place according to the national requirements and best practice. This plan should at least include the type of wastes, the amount of waste and the disposal manner for example: - Remaining debris/construction waste will be re-used as much as possible and/or disposed at the national dump of Ornamibo or other designated public dump acceptable to the Ministry of Public Works, Transport and Communication - Domestic waste produced during construction be collected in waste bags/containers and disposed by regular	Low

					waste practices of the area. - Asbestos containing material should be removed by an asbestos expert. This should be included in the contractors requirements	
Air quality	Traffic along transport routes and along/ on project sites: exhaust gasses and dust from traffic and dust from handling of materials	Very likely	Direct; short term; reversible Consequence: minor	Low	Proper maintenance of vehicles (engines) Prevent dust emissions by covering and wetting of dust producing material during rehabilitation activities or by placing dust screens.	Negligible
Noise	Increased noise levels at project-sites and along transport routes: project traffic and rehabilitation activities on-site (hammering)	Very likely	Direct; short term, reversible Consequence: moderate	Medium	Proper maintenance of vehicles (engines) Planning of specific noisy construction activities before and after office hours. Prior communication about noisy construction activities.	Low
Land and soil	Local contamination: spills of chemicals (paint) or oil spills/leakages from vehicles/equipment	Rare	Direct; short term; reversible Consequence: minor	Low	Proper maintenance of vehicles (engines) HSE guidelines for contractor (toolbox meetings for workers)	Negligible
Hydrology, and Water quality	Connection of drainage of the project buildings to the existing sewerage system: additional pollution load	Very likely	Direct; short term; reversible Consequence: minor	Low	None required (installation according to the guidelines of Public Works).	Negligible
Extreme weather events	High intensity rainfall and winds: damage to constructions works and flooding	Rare	Direct; short term; irreversible Consequence: major	Medium	The contractor should have an emergency plan in place. For example: - for flooding risks have an emergency dewatering pump as back-up - Emergency plan should follow the safety instructions from the Fire Department Prevention - Include instructions from NCCR in case of disasters such as fire, floods, heavy storms.	Low

					Measures which are already included in the design of the buildings: - Type of material and quality of material - The descriptions of the requirements of material to be used and proper treatment for durability are included in the technical specifications of the Architects. - Roof construction is of steel structures and are designed based on wind forces and other variable forces. - Isolation measures against high temperatures. - Approval of design by the Fire Department.	
Climate change	Sea level rise Increase in temperature Increase in rainfall intensity Increase of occurrence and level of wind bursts associated with rain storms.	Rare	Direct; long term; irreversible Consequence: major	Medium	Measures which are already included in the design of the buildings: - Type of material and quality of material. The descriptions of the requirements of material to be used and proper treatment for durability are included in the technical specifications of the Architects. - Roof constructions are steel structures and are designed based on wind forces and variable forces. - Isolation measures against high temperatures. - Approval of design by the Fire Department.	Low

Table 24: Potential social impacts during the construcion phase of the selected historic buildings, their source and mitigation

Construction Phase, applicable for all selected buildings and the yet to be selected buildings						
Social Aspects						
Affected Stakeholders/Resources	**Impact Description**	**Impact Likelihood**	**Impact Characteristics and Consequence**	**Impact Significance**	**Mitigation Measures**	**Residual Impact**
Palm Tree Garden	Cultural heritage site used by indigenous people during festivities may be affected by some dust. There is no specific present-day Indigenous group claiming this place	Likely	Direct; short-term, reversible. Consequence: minor	Low	None required.	Positive
Construction Workers **Employees surrounding offices and businesses** **Educational institutions** **Households ADI**	Increased noise levels at project-site and along transport routes: project traffic and construction activities on-site (hammering)	Very likely Very likely Likely Rare	Direct; medium term; reversible; consequence: moderate	Medium	Wearing ear buds Proper maintenance of vehicles (engines) Planning of specific noisy construction activities before and after office hours. Prior communication about noisy construction activities.	Low
Construction Workers **Employees surrounding offices and businesses**	Exhaust gasses and dust from traffic and dust from handling of materials	Very likely Likely	Direct; medium term; reversible; consequence: moderate	Medium	Proper maintenance of vehicles (engines) Prevent dust emissions by covering and wetting of dust producing material during rehabilitation activities Placing dust screens. Prior communication about dust producing activities so that windows can be kept closed.	Low

Educational institutions **Households ADI**		Likely Rare			Temporary replacement housing for potentially severely affected households. Include procedures in the contractor requirements such as working from the inside of the building (to minimize nuisance).	
Local traffic (Commuter + educational) **Households ADI**	Traffic congestions due to extra construction traffic. Hindrance of commuter traffic.	Likely	Direct; medium term; reversible; consequence: moderate	Medium	Prior communication about the hindrance and obstruction. Limit construction traffic/ heavy traffic between 6:30-8:00am and 12-2pm. Introduce alternative routes for traffic especially during peak hours and certain construction activities for destination traffic and other traffic.	Low
Businesses in the ADI	Decrease or loss of customers/visitors	Likely	Direct; medium term; reversible; consequence: moderate	Medium	Prior communication about construction activities. Placing communication board in different languages (i.e. Dutch, English). Planning certain construction activities before and after work hours preferably not in the weekends, especially during high tourist season. Development of Livelihood Restoration Plan for affected businesses	Low
	Increase of customers/visitors	Likely	Indirect; long-term Consequence: high	Medium	n/a	Positive
Household Mr. J.C. De Mirandastrat #7	Temporarily loss of home	Very likely (only in case the building on Mr. J.C. De Mirandastraat #7 will be selected for rehabilitation)	Direct; medium term; reversible; consequence: major	High	Offering alternative stay for families during construction activities (e.g. at nearby guesthouse De Kleine Historie, Mr. J.C. De Mirandastraat #8) Development of a Resettlement Action Plan (RAP)	Low
Project team	Theft of goods project sites by homeless or opportunists	Very likely	Direct; medium term; reversible; consequence: major	Medium	Guarding project site before, during and after construction activities.	Negligible

Project team **Businesses in the ADI**	Risk of fire during construction period (due to outdated electricity networks)	Likely Rare	Direct; medium term; reversible; consequence: major	High	Consulting Fire Brigade (dep. Prevention) prior to the construction activities. Guarding project site before, during and after construction activities. Contractors should have an emergency plan included in the HSE requirements.	Low
Project team **Employees of surrounding offices and business** **Educational institutions**	Reduced parking spaces	Very likely	Direct; long term, reversible. Consequence: moderate	Medium	Parking by means of efficient planning (reserve space on-site for parking) Use of busses for transport of construction workers to the site. For example, private paid parking across the gas service station at the Wilhelminastraat and the Van Sommelsdijckstraat is reportedly available during daytime.	Low
Construction Workers	Exposure to the possible presence of asbestos.	Rare	Direct; short term, reversible. Consequence: minor	Low	Include specific removal procedures for asbestos/hire an asbestos specialist for removal. Minimal PPE prescription for workers; Delineation of the working area.	Low
Employees and visitors of Ministry of Social Affairs and Ministry of Justice and Police and pedestrians	Blocked access	Very likely	Direct; long term, reversible. Consequence: moderate	Medium	Create an alternative access route and pedestrian facilities Proper and clear signing for alternative routes Media announcement. Delineate pedestrian paths with clear signs and ribbons.	Low
Passengers by	Annoyance from construction workers	Likely	Direct; short term, reversible. Consequence: minor	Low	Training of construction workers: daily toolbox meetings including code of conduct; The HSE plan of the contractors such include sexual harassment policy.	Low
Pedestrians (particularly vulnerable groups such as children, elderly, disabled)	Poor accessibility (especially for people with disability) and blockage of sidewalks by construction fence, sharing of road with cars.	Very likely	Direct; long term; reversible Consequence: moderate	Medium	Create alternative access routes/sidewalks and pedestrian facilities. Proper and clear signing for alternative routes Media announcement Delineate pedestrian paths with clear signs and ribbons	Negligible

Table 25: Potential environmental impacts during the operational phase of the selected historic buildings, their source and mitigation

Operational Phase applicable for all selected buildings						
Environmental Aspects						
Affected Environmental Aspect	**Impact Description**	**Impact Likelihood**	**Impact Characteristics and Consequence**	**Impact Significance**	**Mitigation Measures**	**Residual Impact**
Visual and Aesthetics	Physical presence: modern building with historical characteristics and mix use	Very likely	Direct; long term, irreversible. Consequence: moderate	High	None required	Positive
	Waste	Very likely	Direct, long term, reversible Consequence: minor	Low	Waste management practices. During the operational phase mainly domestic waste is expected. A waste container must be requested from the Waste Collection Department of the Ministry of Public Works, Transportation and Communication. Waste is collected in waste bags and disposed in the container.	Low
Noise	Potential increased noise level due to reflection	Likely	Direct, long term, irreversible Consequence: minor	Low	Open space and noise isolating material incorporated in the designs.	Low
Hydrology, and Water quality	Connection of drainage of the project buildings to the existing sewerage system: additional pollution load	Very likely	Direct; long term; reversible Consequence: minor	Low	None required (installation according to the guidelines of Public Works).	Negligible
Extreme weather events	High intensity rainfall and winds: damage to Buildings; Flooding	Rare	Direct; short term; irreversible Consequence: major	Medium	Consult and follow the standard procedures from NCCR in case of any disaster related to fire (NCCR has specific procedures for different types of disasters such as floods, fire, terrorism and heavy storms)	Low

					Follow the safety instructions from the Fire Department Prevention Measures already included in the design of the buildings: - Type of material and quality of material - The descriptions of the requirements of material to be used and proper treatment for durability are included in the technical specifications of the Architects. - Roof constructions are steel structures and are designed based on wind forces and variable forces. - Isolation measures against high temperatures - Approval of design by the Fire Department	
Climate change	Sea level rise Increase in temperature Increase in rainfall intensity Increase of occurrence and level of wind bursts associated with rain storms. Carbon footprint	Likely	Direct; long term; irreversible Consequence: moderate	Medium	Measures already included in the design of the buildings: - Type of material and quality of material. The descriptions of the requirements of material to be used and proper treatment for durability are included in the technical specifications of the Architects. - Roof construction is of steel structure and is designed based on wind forces and variable forces. - Isolation measures against high temperatures - Approval of design by the Fire Department - Measures for energy efficiency (central ac system, back-up generator) and water consumption are included in the design. - Maintenance of structures	Low

Table 26: Potential social impacts during the operational phase of the selected historical buildings, their source and mitigation

Operational Phase applicable for all selected buildings						
Social Aspects						
Affected Stakeholders/Resources	**Impact Description**	**Impact Likelihood**	**Impact Characteristics and Consequence**	**Impact Significance**	**Mitigation Measures**	**Residual Impact**
Local traffic (Commuter + educational) **Households ADI**	Traffic congestions due to extra employees and activities.	Very likely	Direct; long term; reversible Consequence: moderate	Medium	Ministry of Public Works, Transport and Communication together with the Traffic Police to: Introduce alternative routes for traffic especially during peak hours for Destination traffic and other traffic. Re direction of heavy traffic. All traffic measures should be planned in cooperation with the traffic police.	Low
Businesses in the ADI **Socio-economy**	Increase of customers/visitors Physical presence: Promote tourism Conservation historical aspects Public attraction	Very likely	Indirect; Long term; consequence: major	High	None required	Positive
Employees and visitors of the project buildings and surrounding buildings	Reduced parking spaces	Very likely	Direct; long term term, irreversible. Consequence: moderate	Medium	Make sure to include a parking preferences for people with physical limitations (pregnant women, disability) Make use of available parking places nearby (e.g. private parking lot at the Monseigneur Wulfinghstraat or the parking lot of the Cathedral also at the Monseigneur Wulfingstraat, also see other options in the main report) Government/ Ministries to make agreement with private owners to use dedicated space during office hours.	Low

					Long term recommendations: Construct a multi-level parking garage as proposed by the KDV Architects. Possibility of other (underground) parking garages.	

9 Final Conclusions and Recommendations

The ESIA was prepared for the Rehabilitation and Operation of Historic Buildings.

For the compilation of the baseline section, data of previous studies and from existing sources have been used, but in addition fieldwork has been carried out for general orientation, traffic, noise, soil, hydrology and land-use and water quality. Other specialist studies conducted include an asbestos quick scan.

Also extensive public consultation was undertaken, during which local public stakeholders, local government representatives, and district authorities were consulted. A socio-economic survey was conducted in order to collect general information on households, income, the public utilities, and to learn about the opinion and concerns about the project.

The ESIA describes the available information on the proposed project designs, construction and operational phase. The collected data is considered adequate for the analysis of the impacts.

Comparison of the project activities with the baseline conditions has enabled the identification and analyses of environmental (biophysical as well as socio-economic) impacts of the proposed project. In addition, impacts have been identified by stakeholders. These have been included.

The ESIA report presents an impartial and complete evaluation of the possible impacts of the project. Mitigation measures are presented to manage these impacts.

From the impact assessment and the underlying specialist studies, two major and five moderate negative impacts and two moderate positive impacts, are identified.

All identified significant negative impacts can be effectively reduced to **low impacts** with the implementation of the proposed mitigation measures.

For the household at the Mr. J.C. De Mirandastraat 7 (Building of Ministry of Finance, not yet selected), there is one specific impact to be addressed in case the building will be selected for rehabilitation. This might cause temporary loss of home which would require the development of a Resettlement Action Plan (RAP).

This Project will not cause direct or indirect impacts on Indigenous Peoples, and the IDB Operational Policy on Indigenous Peoples (OP 765) is not triggered in the context of the proposed Project. No specific mitigation plan has been developed for the palm garden. Maroons do not depend on the ADI for their livelihoods or traditions. Therefore, considering Maroon rights does not apply in this study.

Environmental and Social project risks and impacts will be managed through an effective Environmental and Social Management Plan (ESMP) which must be implemented as part of normal operations by incorporating the key components into daily activities, such as including environmental issues in the decision-making process and maintaining complete records. Also, all duties and responsibilities of all involved parties are contained in this plan.

A Non-Technical Summary (in Dutch) of this report will be distributed to stakeholders that have been contacted and other interested parties as soon as it has been clear when the Final Stakeholder Session is planned.

Relevant comments will be included in the final ESIA.

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ANNEXES