

COASTAL PROTECTION, LANDSCAPING AND INFRASTRUCTURAL WORKS IN MAURITIUS

RESIDENCE LA CHAUX SITE ENVIRONMENTAL IMPACT ASSESSMENT REPORT

CONTENTS

Chapter	Description	Page
	EXECUTIVE SUMMARY	
1	INTRODUCTION	1-1
	1.1 General	1-1
	1.1.1 Need for EIA	1-1
	1.2 Overall Project	1-1
	1.2.1 General	1-1
	1.2.2 Coastal Erosion	1-2
	1.2.3 Project Background	1-2
	1.2.4 Previous Studies	1-2
	1.2.5 Actions taken by MSSESD	1-2
	1.3 Overall Project Implementation Timeframe	1-3
	1.4 The Proponent and Project Team	1-3
	1.4.1 The Proponent	1-3
	1.4.2 The Project Team	1-4
	1.5 Residence La Chaux Site	1-4
	1.5.1 Project Brief	1-4
	1.6 Project Implementation Timeframe	1-4
	1.7 Method of Assessment	1-5
	1.7.1 General	1-5
	1.7.2 Phases of Assessment	1-5
	1.7.3 Scoping	1-5
	1.8 Structure of Report	1-5
2	LEGAL FRAMEWORK	2-1
	2.1 Introduction	2-1
	2.2 Legal Framework	2-1
	2.2.1 Environment Protection Act, 2002	2-1
	2.2.2 Regulations	2-2
	2.3 Policies, Planning Schemes and Guidelines	2-3
	2.3.1 General	2-3

2.3.2	National Environment Policy	2-3
2.3.3	National Development Strategy	2-3
2.3.4	Environmentally Sensitive Areas (ESA)	2-3
2.3.5	National Forest Policy	2-4
2.4	International Treaties	2-4
2.4.1	The Convention on Biological Diversity	2-5
2.4.2	International Convention and Protocol Signed/Ratified by Mauritius	2-5
2.4.3	Outline Planning Scheme – Grand Port-Savanne District Council Area	2-6

3 BASELINE ENVIRONMENT 3-1

3.1	Site Location	3-1
3.2	Site Context	3-1
3.2.1	General	3-1
3.2.2	Built Environment	3-2
3.3	Environmentally Sensitive Areas (ESAs)	3-2
3.3.1	General	3-2
3.3.2	Wetland	3-2
3.3.3	Tidal Mudflats	3-2
3.3.4	Mangroves	3-3
3.3.5	Sea Grass	3-3
3.3.6	Coral Reef	3-3
3.4	Physical Site Description	3-3
3.4.1	Site Limits	3-3
3.4.2	Land Use Survey	3-4
3.4.3	Site Topography	3-4
3.4.4	Lagoon Bathymetry	3-4
3.4.5	Stormwater Drainage	3-4
3.4.6	Services/Utilities Infrastructure	3-5
3.5	Site Conditions	3-5
3.5.1	Waterfront Features	3-5
3.5.2	Existing Situation	3-7
3.6	Biodiversity/Ecology	3-8
3.6.1	General	3-8
3.6.2	Assessment of biodiversity at the Site	3-9
3.7	Geomorphology and Sediment Survey	3-10
3.7.1	Geology	3-10
3.7.2	Site Observations	3-10
3.7.3	Sediment Sampling and Test Results	3-11
3.8	Sediment Transport and Morphology	3-11
3.8.1	Sediment Transport and Morphology	3-11
3.9	Coastal Hydrodynamics – Baseline Modelling	3-13
3.9.1	Water Level Analysis	3-13
3.9.2	Tide Levels	3-13
3.9.3	Climate Change and Sea Level Rise	3-14

3.10	Climate	3-15
3.10.1	Water Levels	3-15
3.10.2	Cyclones	3-17
3.10.3	Wind	3-19
3.10.4	Waves and Surges	3-21
3.11	Hydrodynamic Modelling for Residence La Chaux Site	3-21
3.12	Historical/Heritage Features	3-22
3.13	Water Quality	3-22
3.14	Landscape and Aesthetics	3-23
3.15	Air Quality	3-23
3.16	Traffic	3-23
3.17	Noise	3-24
3.18	Socio-economic Activities	3-24
3.18.1	Tourist Industry	3-24
3.18.2	Fisheries	3-24
3.18.3	Other Activities	3-24
3.19	Consultation with Stakeholders	3-24
3.19.1	Ministries and Authorities	3-24
3.19.2	Public Consultation	3-25

4	PROJECT ALTERNATIVES AND JUSTIFICATION	4-1
4.1	General	4-1
4.2	Functional Requirements (Client's Requirements and ToR)	4-1
4.2.1	MSSSED Requirements	4-1
4.2.2	Stakeholder Requirements	4-1
4.3	Other Requirements	4-2
4.3.1	Preliminary Stakeholder Consultation	4-2
4.3.2	Gravel Beach	4-2
4.3.3	Relocation and Upgrading of Boat Ramp	4-2
4.3.4	Boat Mooring and Beaching	4-2
4.4	Construction Aspects	4-2
4.4.1	Access during Construction Period	4-2
4.4.2	Contractor's Work Yard	4-2
4.5	Project Alternatives	4-2
4.5.1	General	4-2
4.5.2	Option 1: Do-nothing Scenario	4-3
4.5.3	Option 2: Gravel Beach (Flexible Revetment)	4-3
(a)	Western part of site from Mangrove Community to Boat Ramp	4-3
(b)	Eastern part of site between Boat Ramp and Community Centre Boundary	4-3
(c)	Area North of Banyan Tree at Community Centre	4-3

4.6	Approved Scheme	4-4
4.7	Clearances	4-4
5	PROJECT DESCRIPTION	5-1
5.1	General	5-1
5.2	Proposed Works and Site Layout	5-1
5.2.1	Extent of site	5-1
5.2.2	Site Layout	5-1
5.2.3	Principal Work Items	5-1
5.3	Drainage	5-1
5.4	Monitoring Beacons	5-2
5.5	Construction Methodology	5-2
6	IMPACT IDENTIFICATION, ASSESSMENT AND MITIGATION	6-1
6.1	Methodology	6-1
6.2	Construction Phase	6-3
6.2.1	General	6-3
6.2.2	Geology and Geomorphology	6-3
6.2.3	Water Quality	6-4
6.2.4	Biodiversity	6-5
6.2.5	Air Quality	6-6
6.2.6	Traffic	6-7
6.2.7	Socio-economic	6-7
6.2.8	Noise	6-8
6.2.9	Health and Safety	6-8
6.3	Operation/Utilisation Phase	6-8
6.3.1	General	6-8
6.3.2	Geomorphology and Hydrodynamic Impacts	6-9
6.3.3	Landscape and Aesthetics	6-9
6.3.4	Socio-economic Impact	6-10
6.3.5	Significance of Impacts during Operation Phase	6-10
6.4	Maintenance as a Mitigation Measure	6-10
7	ENVIRONMENTAL MONITORING PLAN	7-1
7.1	Monitoring during Construction Phase	7-1
7.1.1	Air Quality	7-1
7.1.2	Noise	7-1
7.1.3	Water Quality	7-2
7.1.4	Solid Waste	7-2
7.1.5	Traffic	7-2
7.1.6	Infrastructure	7-3
7.1.7	Health and Safety	7-3
7.2	Monitoring during Operation Phase	7-3

List of Appendices:

- Appendix A : Laboratory Test Results for Water
- Appendix B : Biodiversity Survey Report
- Appendix C : Drawings

List of Appendices:

- Appendix A : Laboratory Test Results for Water and Sediment Samples
- Appendix B : Biodiversity Survey Report
- Appendix C : Drawings

List of Drawings:

<u>Drawing Title</u>	<u>Drawing Number</u>
Context Map	M190/LC/EV/01
Sampling Location	M190/LC/EV/02
Location Plan	M190/LC/DD/01
Topographic Map	M190/LC/DD/02
General Layout and Section	M190/LC/DD/03
Details of Monitoring Beacon and Warning Sign	M190/LC/DD/04

Figure 3-3: Stormwater drainage and culverts	3-5
Figure 3-4: Site Waterfront	3-6
Figure 3-5: Erosion along Site Waterfront	3-7
Figure 3-7: Historical aerial image (1967)	3-12
Figure 3-8: Direction of mean wave energy flux (top) and wave rose (bottom).....	3-12
Figure 3-9 Raw water level data measures at Port Louis (Caldwell, et al, 2015), shown relative to Mean Sea Level (MSL)	3-13
Figure 3-10 Water level data measured at Port Louis (Caldwell, et al., 2015). The data shown was detrended, with a mean level equal to the measured mean level at 1995, calculated as the average over 1986-2005.	3-14
Figure 3-11 Measured Water Level at Port Louis with SLR Trend Lines	3-15
Figure 3-12 Extract from Chapter 13: Sea level change in the Fifth Assessment Report (IPCC,2013)	3-16
Figure 3-13 SLR projections for this century, showing upper limit values for 2040 and 2070 (IPCC, 2013)	3-17
Figure 3-14 MFR best track data for the years 1980 to 2015. Also indicated are the three locations used in the calculation of extreme wind speed.	3-18
Figure 3-15 Time-series of modelled peak wind speeds for all historical tropical cyclones from 1979 to 2015 at the three locations in Mauritius	3-18
Figure 3-16 Trends in average wind speed based upon climate change (Tokinaga, 2011)	3-20
Figure 3-17 Trend in wind speeds per decade for 1998-2010 for different climate models (IPCC, 2013)	3-20