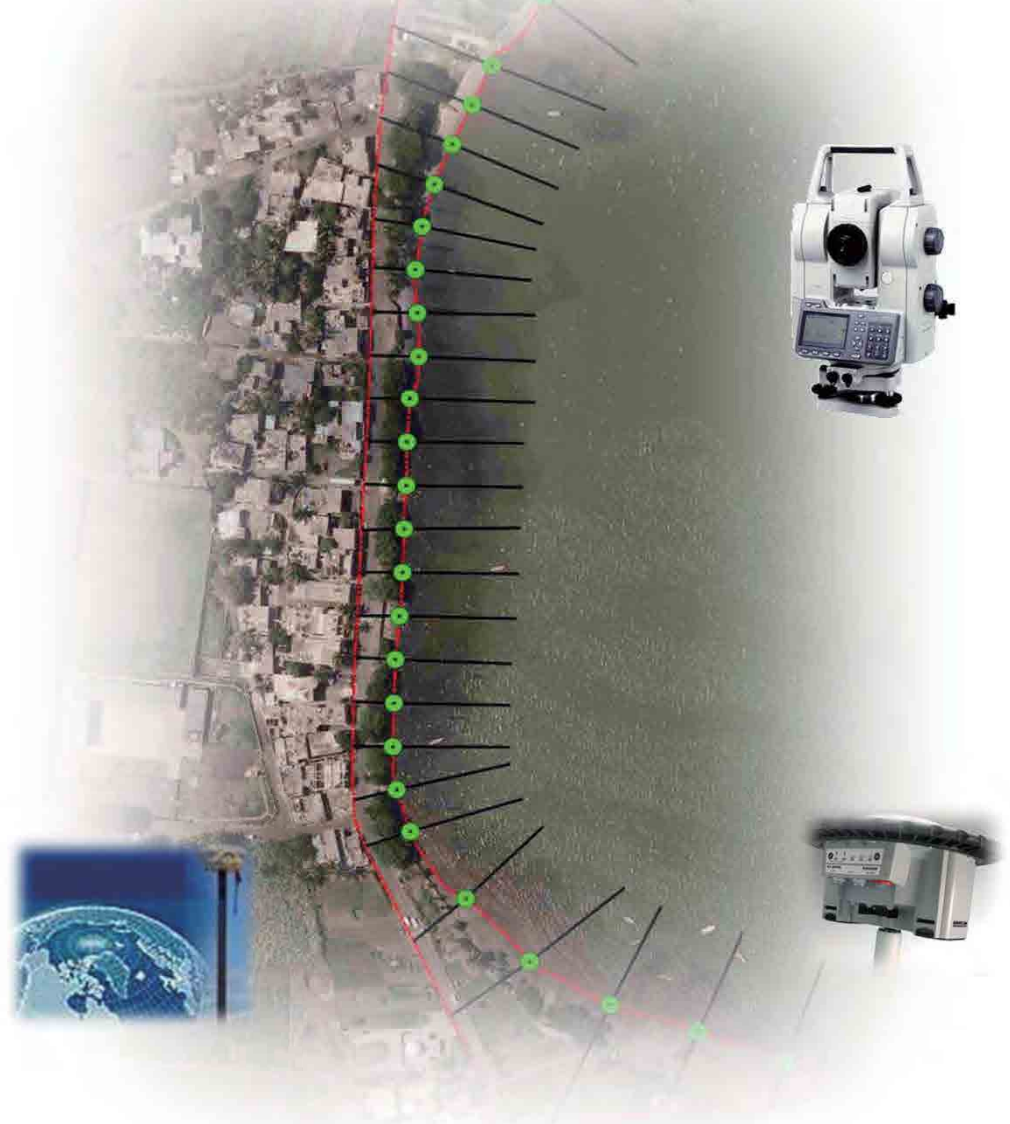


8. Result of Topographic Survey

REPUBLIC OF MAURITIUS

**TOPOGRAPHIC SURVEY WORK
ON COASTAL PROTECTION SITES ON
THE PROJECT FOR CAPACITY DEVELOPMENT ON
COASTAL PROTECTION AND REHABILITATION,
THE PROJECT OF LANDSLIDE MANAGEMENT IN
THE REPUBLIC OF MAURITIUS**

GRAND SABLE SITE



SURVEY REPORT

GIBB

GIBB (Mauritius) Ltd
GIBB House
71, Sayed Hossen Road
Solferino
Mauritius

AUGUST 2013

GIBB

REPUBLIC OF MAURITIUS

**TOPOGRAPHIC SURVEY WORK
ON COASTAL PROTECTION SITES
ON
THE PROJECT FOR CAPACITY DEVELOPMENT ON
COASTAL PROTECTION AND REHABILITATION, THE
PROJECT OF LANDSLIDE MANAGEMENT IN THE
REPUBLIC OF MAURITIUS**

GRAND SABLE SITE

M158

August 2013

TOPOGRAPHIC SURVEY WORK ON COASTAL PROTECTION SITES ON THE PROJECT FOR CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND REHABILITATION, THE PROJECT OF LANDSLIDE MANAGEMENT IN THE REPUBLIC OF MAURITIUS AT GRAND SABLE SITE

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Appendix A: Stations Witnessing

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Appendix C: CD containing Soft copy of Report and Drawings

1 PROJECT BACKGROUND AND SCOPE OF WORKS

1.1 Project Background

Kokusai Kogyo Co Ltd, the Consultant for Japan International Cooperation Agency (JICA) on the projects of Capacity Development on Coastal Protection and Rehabilitation and Landslide Management in the Republic of Mauritius has appointed GIBB (Mauritius) Ltd to carry out the topographic and cross sections surveys for a site situated at Grand Sable along the eastern coast of Mauritius as shown in Figure 1.1.

1.2 Project Site

The project site spans over a distance of about 650m and lies generally in a north-south direction. It covers a land area of about 0.02km² including the coast road and a sea area of about 0.03km² in shallow waters.

The extent of the project site is shown in Figure 1.2.

1.3 Objective

The objective of the assignment is to obtain topographic information to allow the Consultant to design the demonstration project.

1.4 Scope of Works

In general, the scope of the Works comprises:

- Establishment of geodetic control on site
- Fixing of permanent survey control points for the present and future cross sections survey
- Topographic survey
- Cross-sections survey
- Digital mapping of survey data
- Preparation of a Survey Report as deliverable for the assignment.

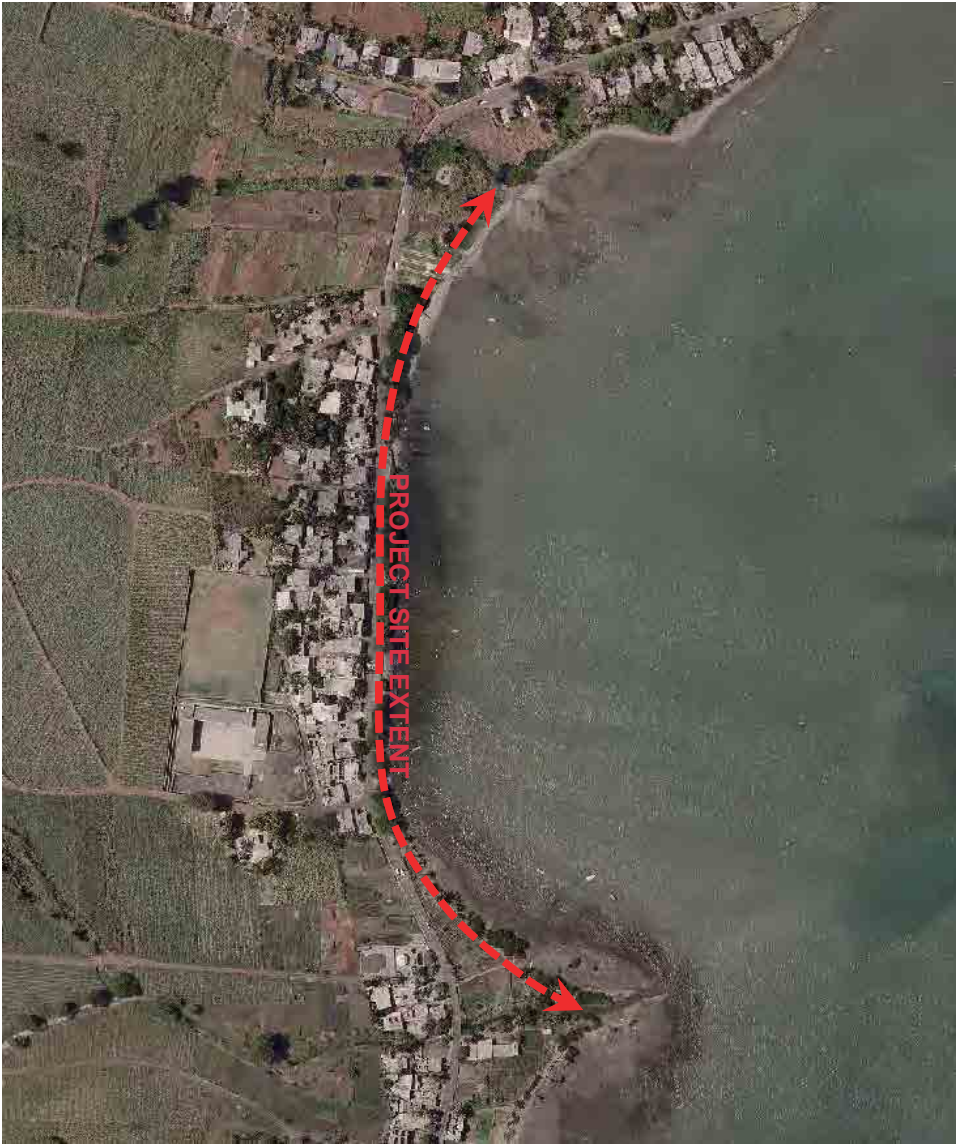


Figure 1.2 – Site Limits

2 FIELD SURVEYS AND MAPPING

2.1 Kick-off Site Visit

A joint site visit was carried out on 8 July 2013 by the Consultant and the GIBB Team to identify the locations of the cross sections and key features to be surveyed at the site.

Land owners within the project site were contacted by the GIBB Team on the same day with a view to obtaining authorisation to carry out the surveys across their properties.

Field work was initiated on 11 July 2013.

2.2 Geodetic Control

2.2.1 Reconnaissance Survey

A reconnaissance survey was carried out to identify geodetic control points in the vicinity of the site.

The following trigonometric points were identified:

- GPS 141 at Pointe du Diable
- GPS 134 at Grande Riviere Sud Est.

These points lie at 2km to the south and 4.7km to the north of the site respectively and are related to the Local Grid of Mauritius (LGM) 2012 Coordinates Network established by the Ministry of Housing and Lands.

The coordinates of these points are given in Table 2.1 below.

Table 2.1 – XYZ Coordinates of Geodetic Control Points

Point ID	Easting (m)	Northing (m)	Elevation (AMSL) (m)
GPS141	272420.50	343159.36	3.590
GPS134	271959.21	349700.28	-

2.2.2 Horizontal Control

Horizontal control was established on site from the two geodetic control points given in Table 2.1 by the static survey positioning technique.

Baseline observations were carried at each of these two geodetic control points to two survey stations established on the project site. Horizontal precision achieved was in the range of 1 to 5mm.

The computed coordinates of the survey stations, which were subsequently used for positioning during the topographic and cross sections surveys, are as given in Table 2.2 below.

Table 2.2 – XY Coordinates of Survey Stations

Point ID	Easting (m)	Northing (m)	Elevation (m)
STN1	271494.27	345182.82	1.358
STN2	271603.34	344694.92	1.404

Station witnessing of GPS141, GPS134, STN1 and STN2 are given in Appendix A.

2.2.3 Vertical Control

Vertical control was brought on site from GPS141, which has an elevation of 3.590m above Mean Sea Level (AMSL) Datum, as established by the Ministry of Housing and Lands.

Double-run levelling was carried out from GPS141 to the two survey stations on site.

A misclosure of 19mm was obtained for the 3.2km, single direction levelling route, which is within the allowable misclosure of $20\sqrt{k}$ mm (k=distance run in one direction).

The control stations established on site for the cross sections survey were thereafter tied to these benchmarks.

2.3 Topographic Survey

7 No secondary survey stations were established on site for the purpose of topographic detailing by the tri-tripod traversing technique.

These secondary traverse stations were then heighted into the MSL datum by double-run levelling.

The XYZ coordinates of the secondary survey stations are given in Table 2.3 overleaf.

Topographical features surveyed include:

- Roads, tracks and footpaths
- Manholes and chambers
- Watercourses, marshes and dug wells

- Concrete structures and kiosks
- Culverts and drainage structures
- Buildings, lamp posts and beach amenities
- Electricity and telecommunication poles
- Clusters of trees and significant individual trees
- Fences
- High Water Mark.

Table 2.3 – XYZ Coordinates of Secondary Stations

Point ID	Easting (m)	Northing (m)	Elevation (AMSL) (m)
STN3	271465.98	345236.10	2.415
STN4	271451.04	345132.90	2.485
STN5	271448.10	345046.42	2.922
STN6	271445.65	344956.93	3.085
STN7	271441.70	344835.13	1.782
STN8	271477.24	344747.25	2.048
STN9	271509.15	344680.913	2.283

2.4 Cross Sections Survey

26 No cross sections have been surveyed across the project site.

These cross sections, which extend over a distance at least 50m seaward from the high water mark start from the landward side of the coast road.

Spot levels along the cross sections were taken at locations with significant changes in elevation on the landward side and at about 7m interval at sea.

Markers in the form of steel pegs embedded in concrete or concrete nails/steel pegs hammered in asphalt define the cross sections control stations on site.

2.5 Mapping and Drawings

2.5.1 Topographic Map

The topographic features surveyed have been mapped on Autocad and contours produced at a vertical interval of 0.5m.

The topographic map is enclosed in Appendix B as drawing M158/GS/01. The scale of the map is 1:500 on A1 size paper.

2.5.2 Cross Sections

Cross sections have been drawn at intervals of about 40m between sections 1 to 3 and 21 to 26 and 20m between sections 3 and 21.

The cross sections have been drawn at a scale of H 1:1000 and V 1:100 on A1 size paper and are shown in drawing M158/GS/02 in Appendix B. The vertical scale has been exaggerated 10 times the horizontal scale to better depict the variation of the ground profile.

2.5.3 Plotting Scale

The topographic map and cross sections can be plotted at any scale to suit different sizes of paper from the soft version in Autocad format enclosed in the CD at Appendix C.

2.6 Instrumentation

2.6.1 Static Survey

The static survey to establish horizontal control over the project site has been carried out with the GRX1 GPS GNSS system. Post processing and network adjustments have been carried out with Spectrum Survey Office software developed for Sokkia instruments.

Two GPS receivers were used for the static survey.

2.6.2 Levelling Survey

Levelling survey was carried out with a Sokkia B20 automatic level and aluminium staff.

2.6.3 Traversing and Topographic Detailing

These surveys were carried out with 2 No Sokkia Geodetic Total Stations, namely the 650RX and Powerset 2010.

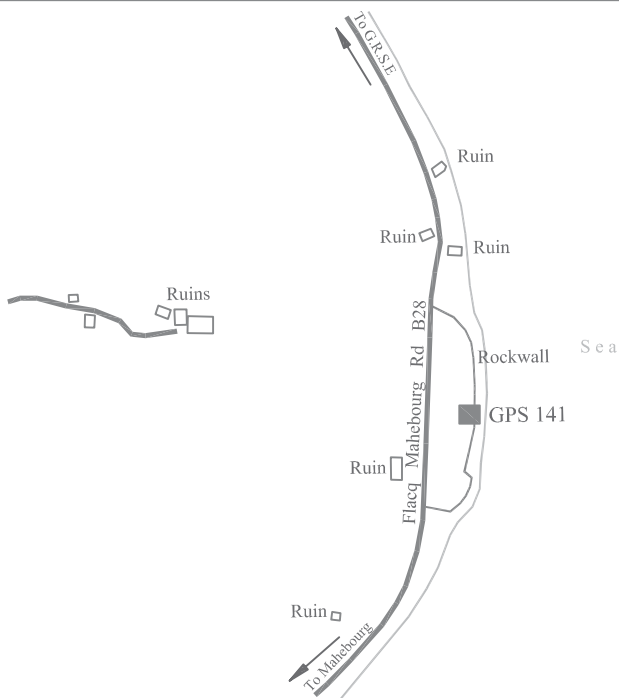
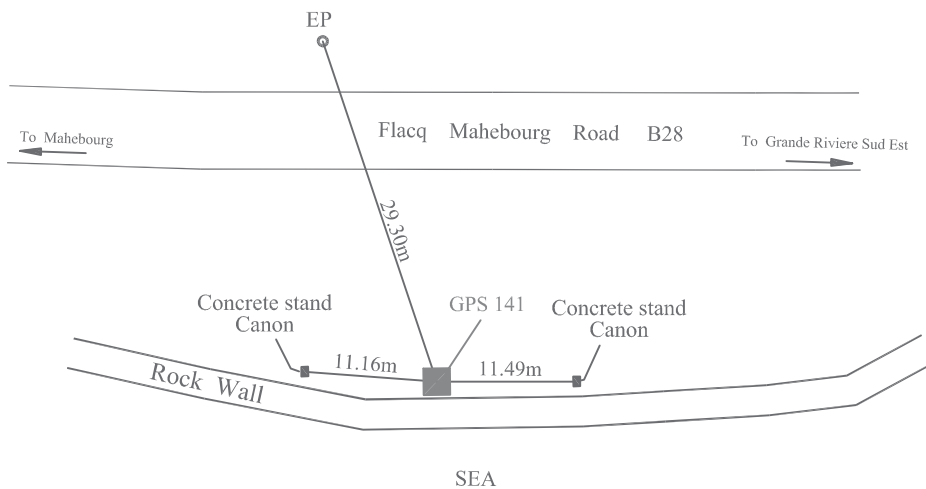
APPENDICES

APPENDIX A
STATIONS WITNESSING

STATION DESCRIPTION

CONTROL POINT ID	GPS 141	LATITUDE (d m s) GDM 2008	S20°20'13.83030"
		LONGITUDE (d m s)	E57°46'45.36197"
LOCATION	POINTE DU DIABLE	COORDINATES MGM 2008	581,342.37 mE 7,751,013.93 mN
SURVEY BLOCK	Secondary	COORDINATES LGM 2012	272,420.50 mE 343,159.36 mN
MARK	Brass bolt in concrete	COORDINATES LCO- LE POUCE GRID	1,026,151.76 mE 984,582.87 mN
DESCRIBED BY	Cadastre Unit	HEIGHT (amsl)	3.590 m
REMARKS: Brass Bolt in Concrete slab, good condition		ELLIPSOIDAL HEIGHT	-0.296 m
		DATE: 09.05.11	

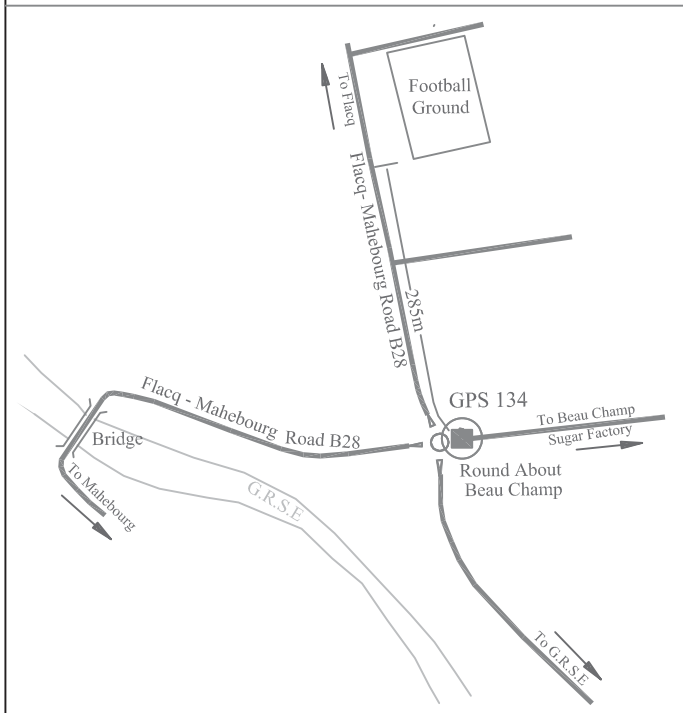
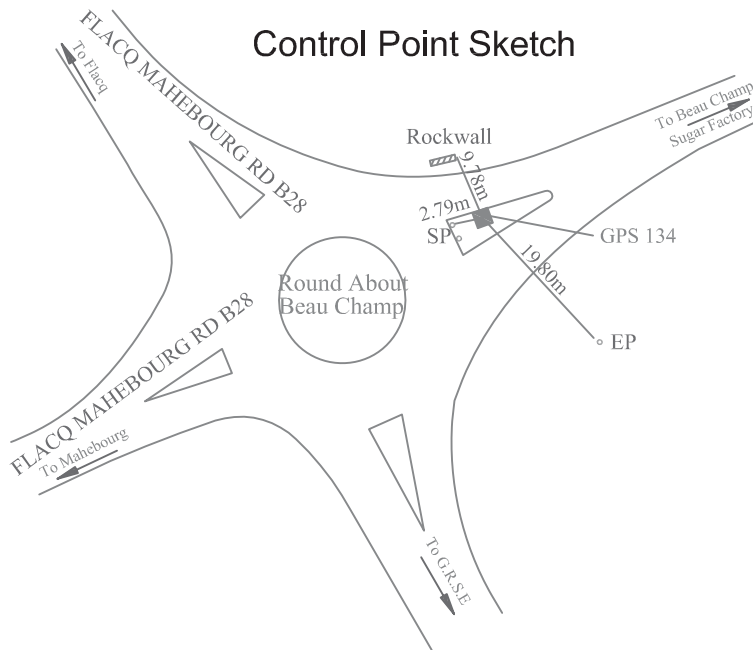
Control Point Sketch

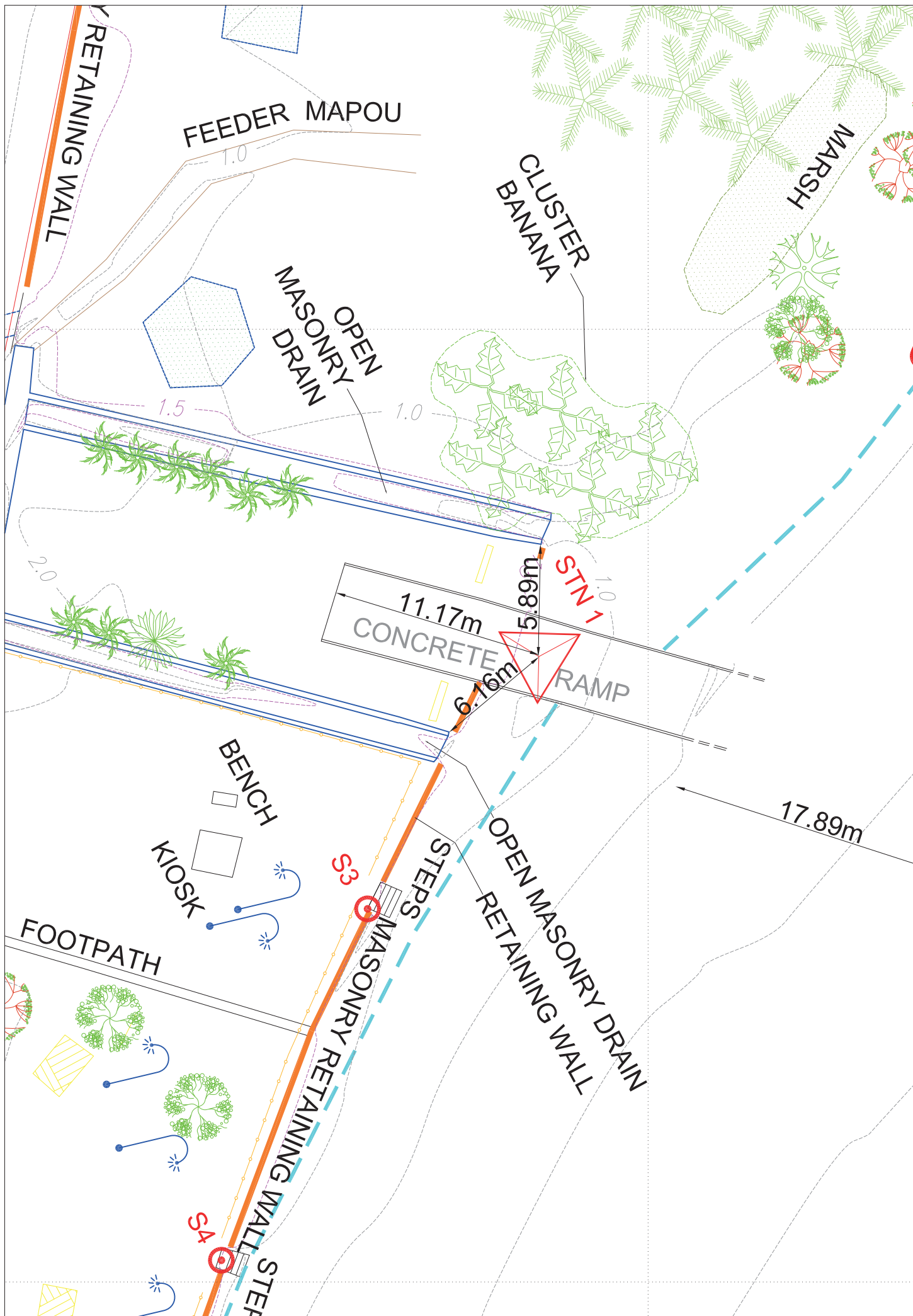


STATION DESCRIPTION

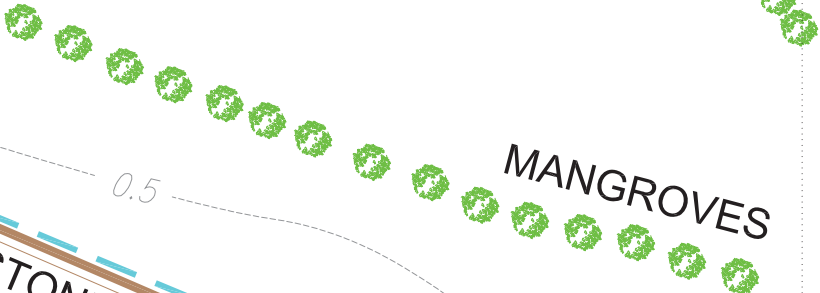
CONTROL POINT ID	GPS 134	LATITUDE (d m s) GDM 2008	S20°16'41.15161"
		LONGITUDE (d m s)	E57°46'29.17216"
LOCATION	GRSE	COORDINATES MGM 2008	580,903.60 mE 7,757,554.33 mN
SURVEY BLOCK	Secondary	COORDINATES LGM 2012	271,959.21 mE 349,700.28 mN
MARK	Brass bolt in concrete	COORDINATES LCO- LE POUCE GRID	1,025,692.29 mE 991,123.85 mN
DESCRIBED BY	Cadastre Unit	HEIGHT (amsl)	38.179 m (EGM 2008 Geoid)
REMARKS: Brass Bolt in Concrete slab, good condition		ELLIPSOIDAL HEIGHT	33.894 m
DATE: 09.05.11			

Control Point Sketch





CLUSTER MANGROVE



MANGROVES

STN 1



0.5

STONEWALL

17.89m

STN 2

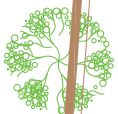


CATTLING
PEN

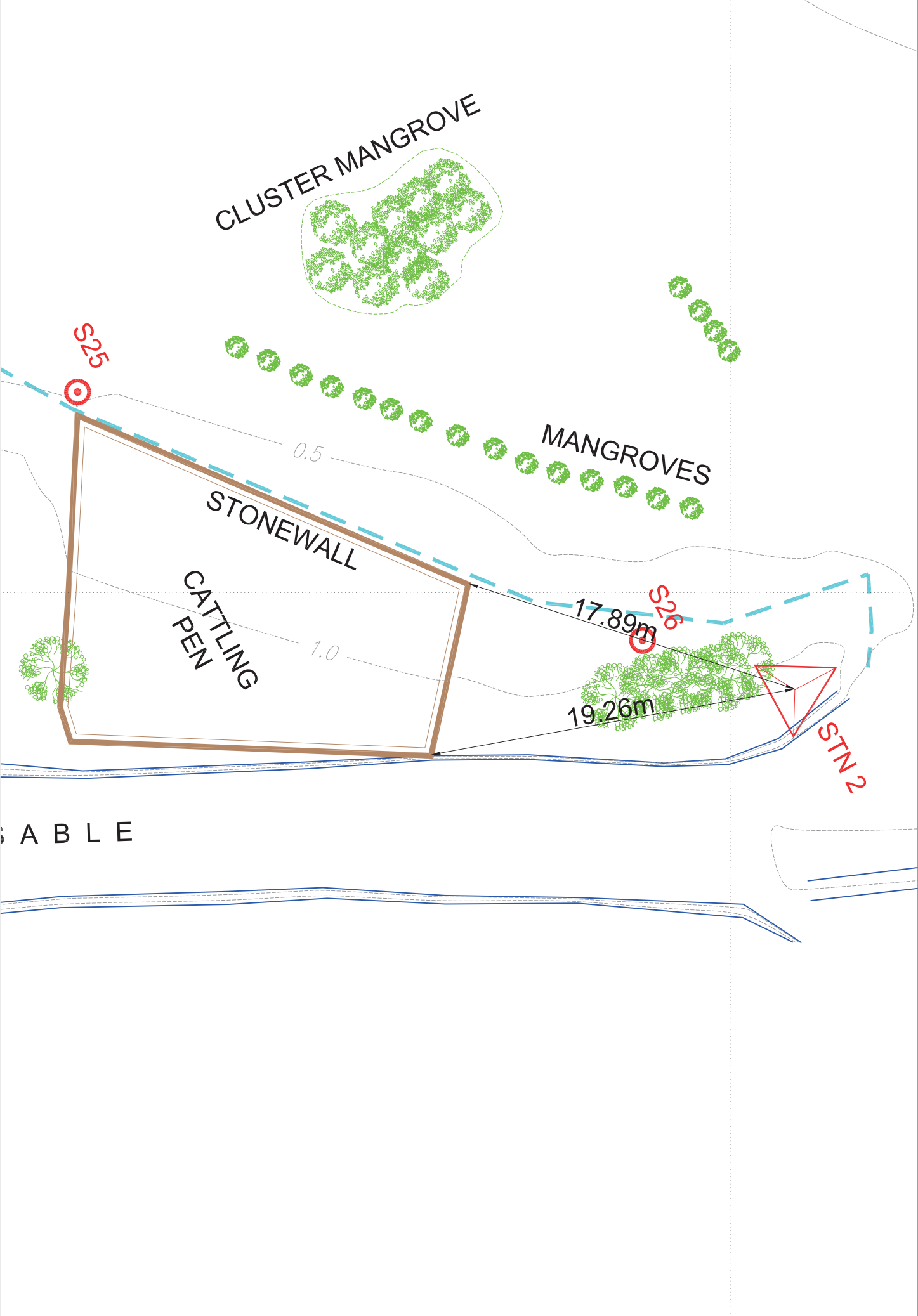
1.0

19.26m

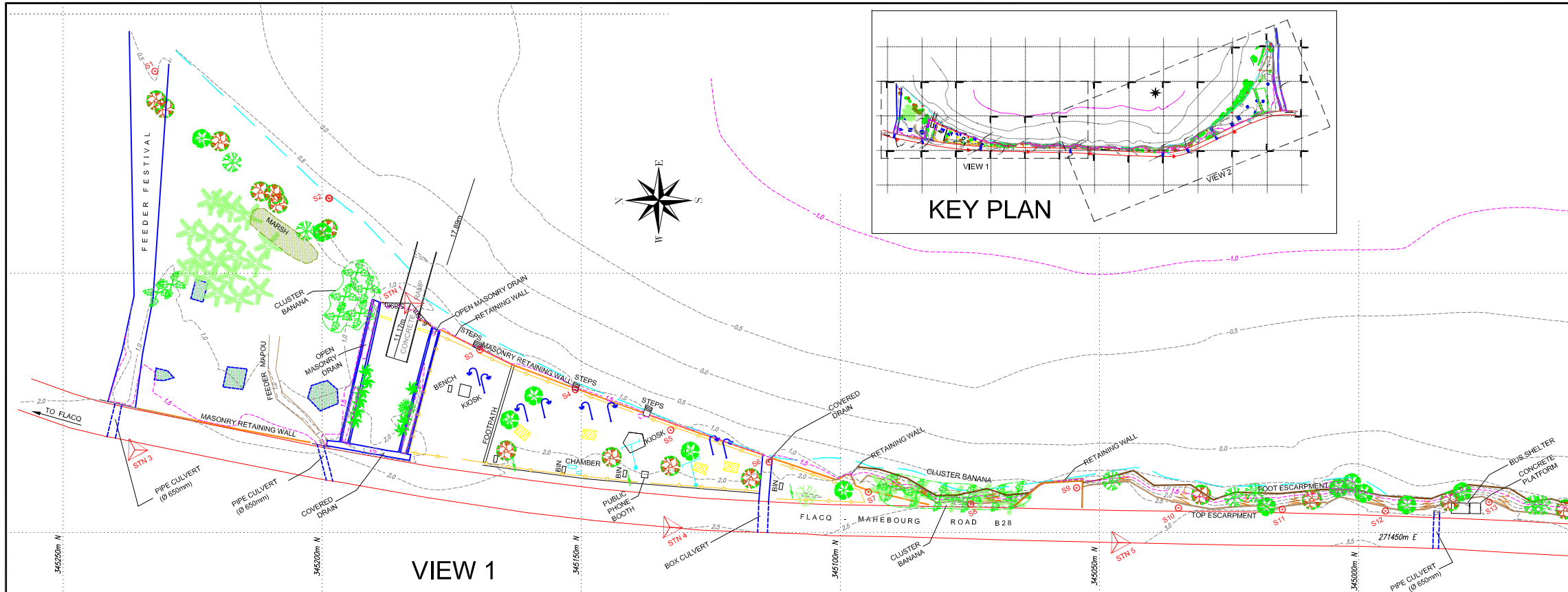
STN 2



S A B L E



APPENDIX B
DRAWINGS



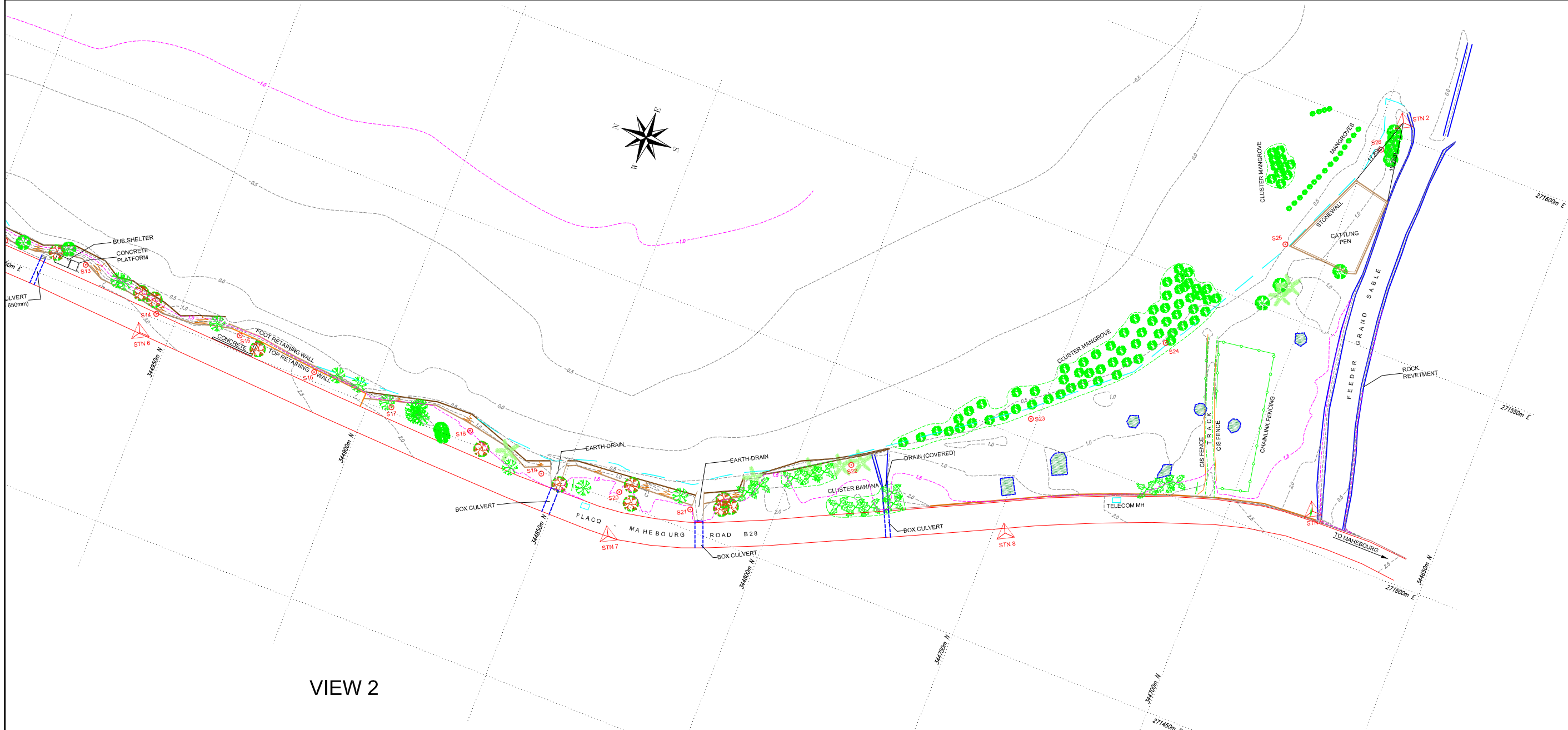
VIEW 1

LEGEND

	Flao		BENCHES & TABLE
	Palm Tree		EARTH DRAIN
	Coconut Tree		CHAMBER/MANHOLE
	Coqueluche		WOODEN HAND-RAIL
	Tree		WELL
	Latanier		CONTROL POINT
	Badamier		CROSS SECTION STATIONS
	CONTOUR LINES		CROSS SECTION STATIONS
	HIGH WATER MARK AS SURVEYED ON SITE		TELECOM POLE
			LAMP POST
			ELECTRIC POLE

GENERAL NOTES:

1. THE SURVEY CONTROL STATIONS ARE ATTACHED TO LGM2012
2. ALL LEVELS ARE REDUCED TO MEAN SEA LEVEL DATUM
3. CONTOUR LINES ARE AT 0.5m VERTICAL INTERVAL



VIEW 2

REVISIONS					
NO.	DATE	DETAILS	CH	CK	AP

CLIENT
KOKUSAI KOGYO Co. Ltd

PROJECT
SURVEY ON COASTAL PROTECTION SITES
GRAND SABLE SITE

STAGE
SURVEY

DRAWING TITLE
TOPOGRAPHIC MAP

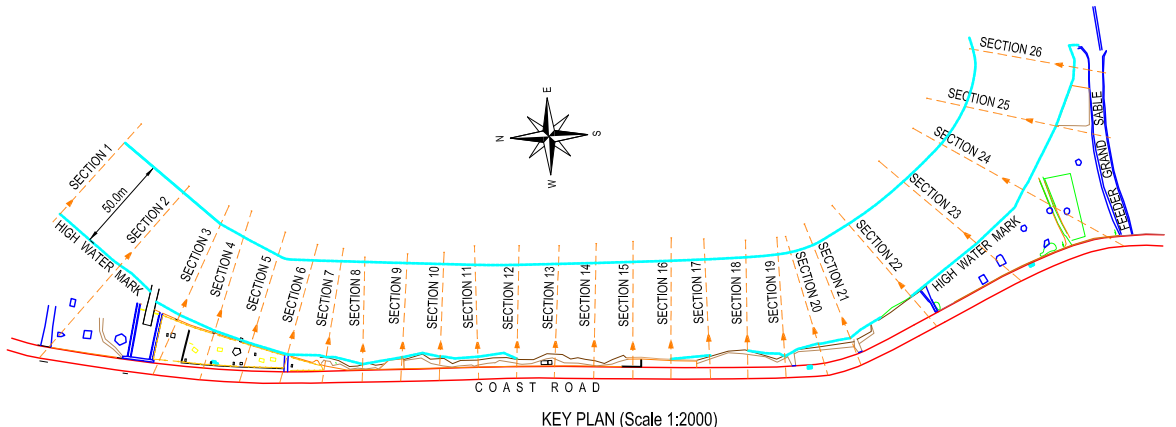
SCALE: 1:500 @ A1 DATE: AUGUST 2013
DRAWING NO. M158 / GS / 01 REV

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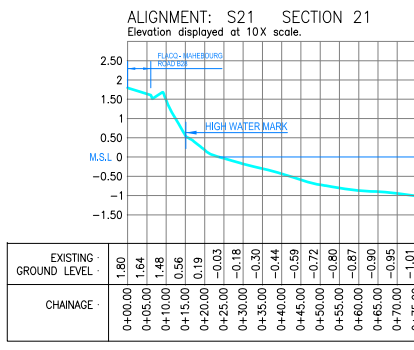
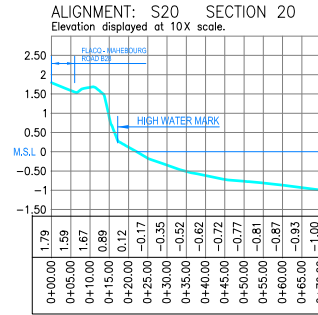
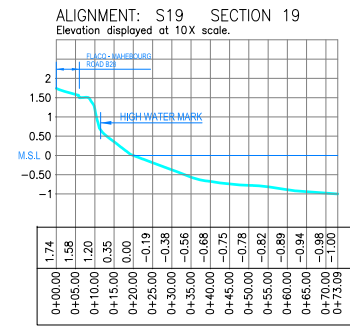
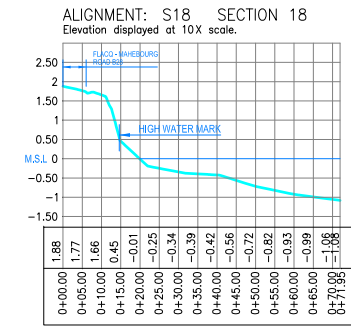
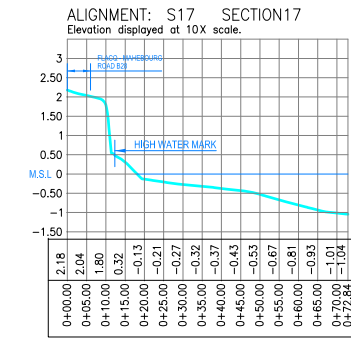
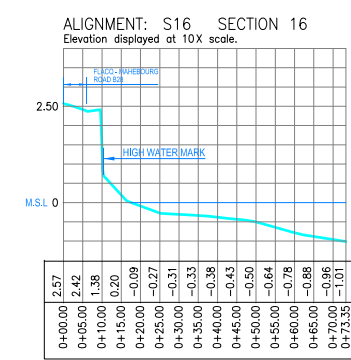
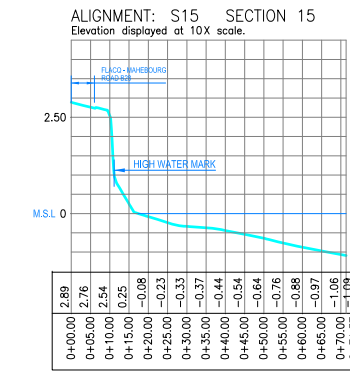
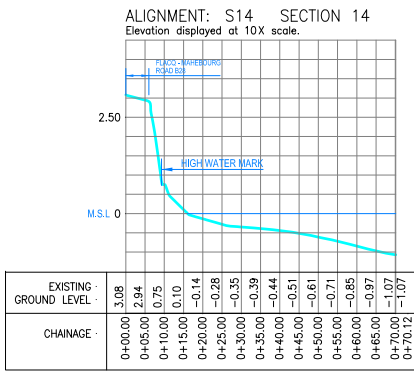
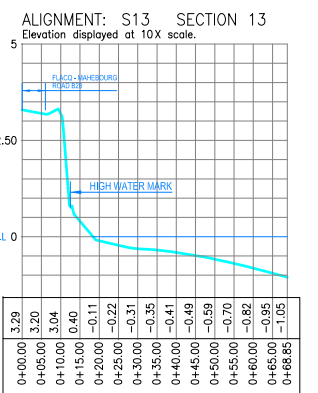
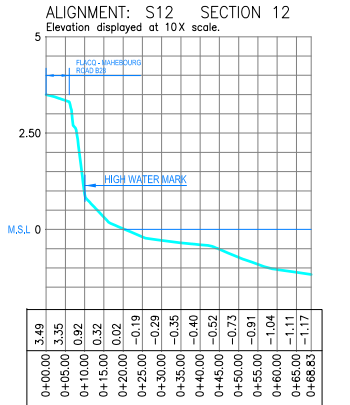
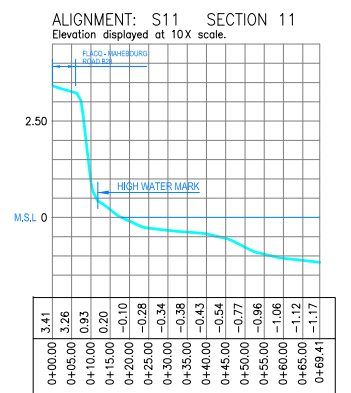
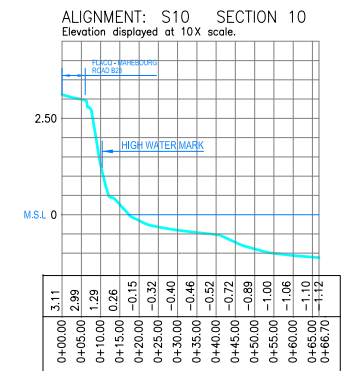
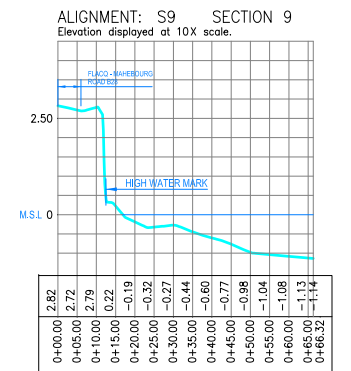
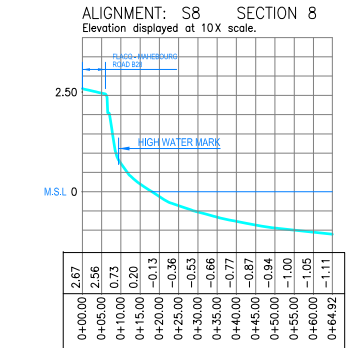
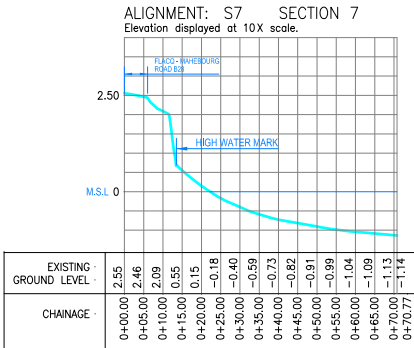
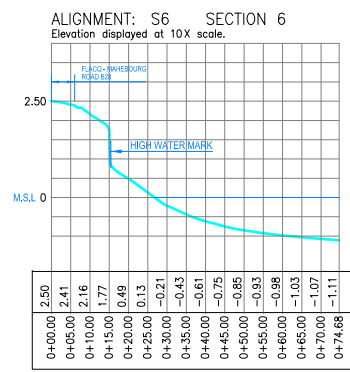
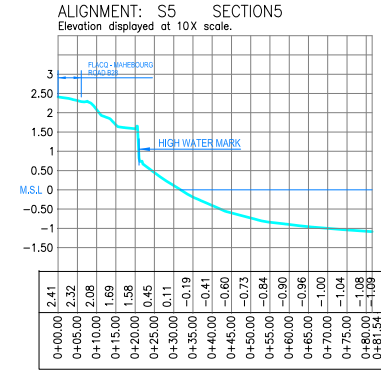
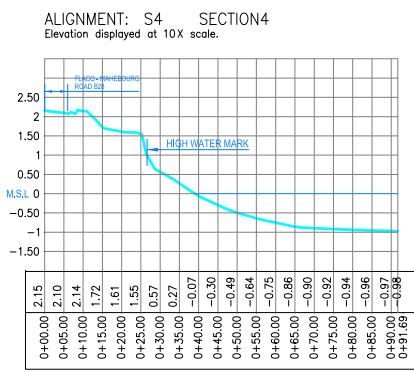
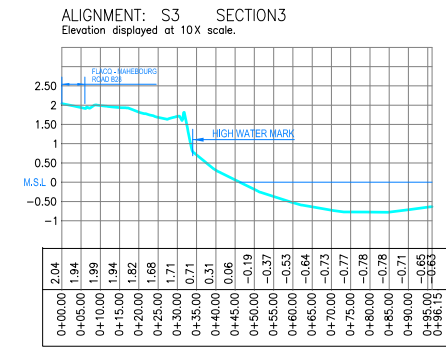
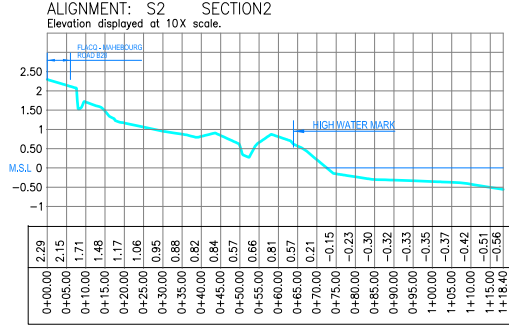
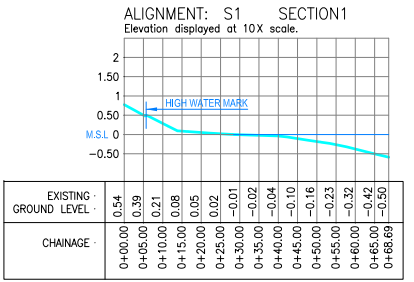
CONSULTING ENGINEER
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GIBB (MAURITIUS) LTD
GIBB HOUSE
71, SAYED HOSSEN ROAD, SOLFERINO MAURITIUS
PHONE : +230 402 1900
FAX : +230 427 6800
EMAIL : gibb@intnet.mu

THIS DRAWING IS NOT TO BE USED IN WHOLE OR IN PART OTHER THAN FOR THE INTENDED PURPOSE AND PROJECT. REFER TO THE CONTRACT FOR FULL TERMS AND CONDITIONS.

GENERAL NOTES:



KEY PLAN (Scale 1:2000)



APPENDIX C

CD

REPUBLIC OF MAURITIUS

**TOPOGRAPHIC SURVEY WORK
ON COASTAL PROTECTION SITES ON
THE PROJECT FOR CAPACITY DEVELOPMENT ON
COASTAL PROTECTION AND REHABILITATION,
THE PROJECT OF LANDSLIDE MANAGEMENT IN
THE REPUBLIC OF MAURITIUS**

POINTE D'ESNY SITE



SURVEY REPORT

GIBB

GIBB (Mauritius) Ltd
GIBB House
71, Sayed Hossen Road
Solferino
Mauritius

OCTOBER 2013

GIBB

REPUBLIC OF MAURITIUS

**TOPOGRAPHIC SURVEY WORK
ON COASTAL PROTECTION SITES
ON**

**THE PROJECT FOR CAPACITY DEVELOPMENT ON
COASTAL PROTECTION AND REHABILITATION, THE
PROJECT OF LANDSLIDE MANAGEMENT IN THE
REPUBLIC OF MAURITIUS**

POINTE D'ESNY SITE

M158

October 2013

TOPOGRAPHIC SURVEY WORK ON COASTAL PROTECTION SITES ON THE PROJECT FOR CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND REHABILITATION, THE PROJECT OF LANDSLIDE MANAGEMENT IN THE REPUBLIC OF MAURITIUS AT POINTE D'ESNY SITE

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Appendices:

Appendix A: Stations Witnessing

Appendix B: Drawings

Appendix C: CD containing Soft copy of Report and Drawings

1 PROJECT BACKGROUND AND SCOPE OF WORKS

1.1 Project Background

Kokusai Kogyo Co Ltd, the Consultant for Japan International Cooperation Agency (JICA) on the projects of Capacity Development on Coastal Protection and Rehabilitation and Landslide Management in the Republic of Mauritius has appointed GIBB (Mauritius) Ltd to carry out beach cross section surveys for a site situated at Pointe d'Esny along the south eastern coast of Mauritius near Blue Bay as shown in Figure 1.1.

1.2 Project Site

The project site stretches over a distance of about 2.8km from the jetty at place called *Pointe Corps de Garde* at Blue Bay to *Pointe d'Esny*, south of Pointe Gerome and covers a coastal strip of about 50m.

The extent of the project site is shown in Figures 1.2.

1.3 Objective

The objective of the assignment is to obtain topographic information that will be used to assist in the formulation of the coastal conservation plan at Pointe d'Esny.

1.4 Scope of Works

In general, the scope of the Works comprises:

- Establishment of geodetic control on site
- Fixing of permanent survey control points (at least 6 No) for future surveys
- Survey of 18 No cross-sections
- Preparation of cross section drawings.



Figure 1.2 – Site Limits

2 FIELD SURVEYS AND MAPPING

2.1 Kick-off Site Visit

A joint site visit was carried out on 12 July 2013 by the Consultant and the GIBB Team to identify the locations and starting points of the 18 No cross sections to be surveyed.

Land owners within the project site were contacted by the Consultant and the MoESD with a view to obtaining authorisation to carry out the surveys on their properties.

Field work was initiated on 15 July 2013.

2.2 Geodetic Control

2.2.1 Reconnaissance Survey

A reconnaissance survey was carried out to identify geodetic control points in the vicinity of the site.

The following trigonometric points were identified:

- GPS 2181 at Bois des Amourettes
- GPS 151 at Blue Bay.

These points lie at 9km to the north and 1km to the west of the site respectively and are related to the Local Grid of Mauritius (LGM) 2012 Coordinates Network established by the Ministry of Housing and Lands.

The coordinates of these points are given in Table 2.1 below. Station witnessing of GPS 2181 and GPS 151 are enclosed in Appendix A.

Table 2.1 – XYZ Coordinates of Geodetic Control Points

Point ID	Easting (m)	Northing (m)	Elevation (AMSL) (m)
GPS2181	268228.08	339697.07	1.491
GPS151	265220.12	331630.07	10.699

2.2.2 Horizontal Control

Horizontal control was established on site from the two geodetic control points given in Table 2.1 by the static survey positioning technique.

Baseline observations were carried at each of these two geodetic control points to 6 No survey stations established on the project site. Horizontal precision achieved was within 5mm.

The computed coordinates of the survey stations, which were subsequently used for positioning during the cross sections surveys, are given in Table 2.2 below.

Table 2.2 – XY Coordinates of Survey Stations

Point ID	Easting (m)	Northing (m)	Elevation (m)
CP1	265856.83	331318.33	0.496
CP2	265893.93	331179.47	1.904
CP3	266307.91	331428.95	0.891
CP4	266452.11	331595.24	0.206
CP5	266969.21	332299.47	0.694
CP6	267049.36	333265.35	0.736

The locations of the survey stations are shown in Plates 1 to 6 in Appendix A.

2.2.3 Vertical Control

Vertical control was brought on site from GPS151, which has an elevation of 10.699m above Mean Sea Level (AMSL) Datum, as established by the Ministry of Housing and Lands.

Double-run leveling was carried out from GPS151 to the two survey stations on site.

A misclosure of 14mm was obtained for the 3.5km, single direction leveling route, which is within the allowable misclosure of $20\sqrt{k}$ mm (k=distance run in one direction).

The control stations established on site for the cross sections survey were thereafter tied to these benchmarks.

2.3 Cross Sections Survey

18 No cross sections have been surveyed within the project site.

These cross sections either start from the property boundary walls or 10m behind the top of the sand dune where there are no boundary fences on the landward side to 50m into the sea or a to maximum depth of 1.50m below MSL.

The cross sections have been permanently fixed on site in the form of steel pegs embedded in a concrete surround as shown in the photo hereunder.



2.4 Mapping and Drawings

2.4.1 Cross Sections

Cross sections have been drawn at intervals of about 40m between sections 1 to 3 and 21 to 26 and 20m between sections 3 and 21.

The cross sections have been drawn at a scale of H 1:1000 and V 1:100 on A1 size paper and are shown in drawing M158/PE/01 in Appendix B. The vertical scale has been exaggerated 10 times the horizontal scale to better depict the variation of the ground profile.

2.4.2 Plotting Scale

The cross sections can be plotted at any scale to suit different sizes of paper from the soft version in Autocad format enclosed in the CD at Appendix B.

2.5 Instrumentation

2.5.1 Static Survey

The static survey to establish horizontal control over the project site has been carried out with the GRX1 GPS GNSS system. Post processing and network adjustments have been carried out with Spectrum Survey Office software developed for Sokkia instruments.

Two GPS receivers were used for the static survey.

2.5.2 Leveling Survey

Leveling survey was carried out with a Sokkia B20 automatic level and aluminium staff.

2.5.3 Traversing and Topographic Detailing

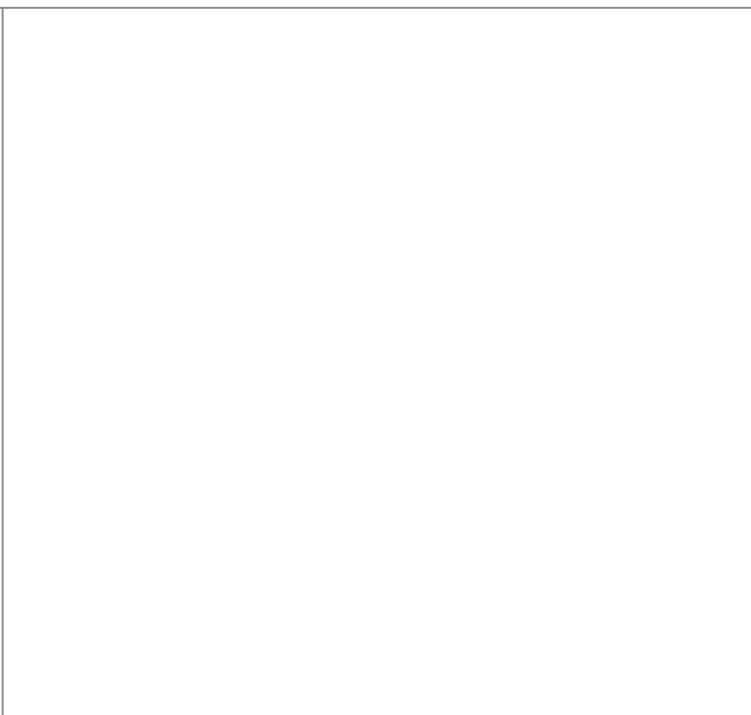
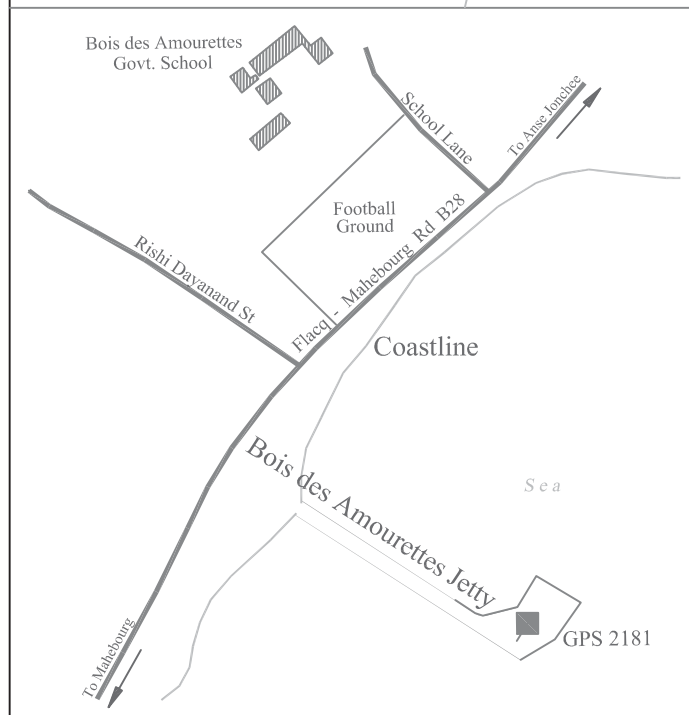
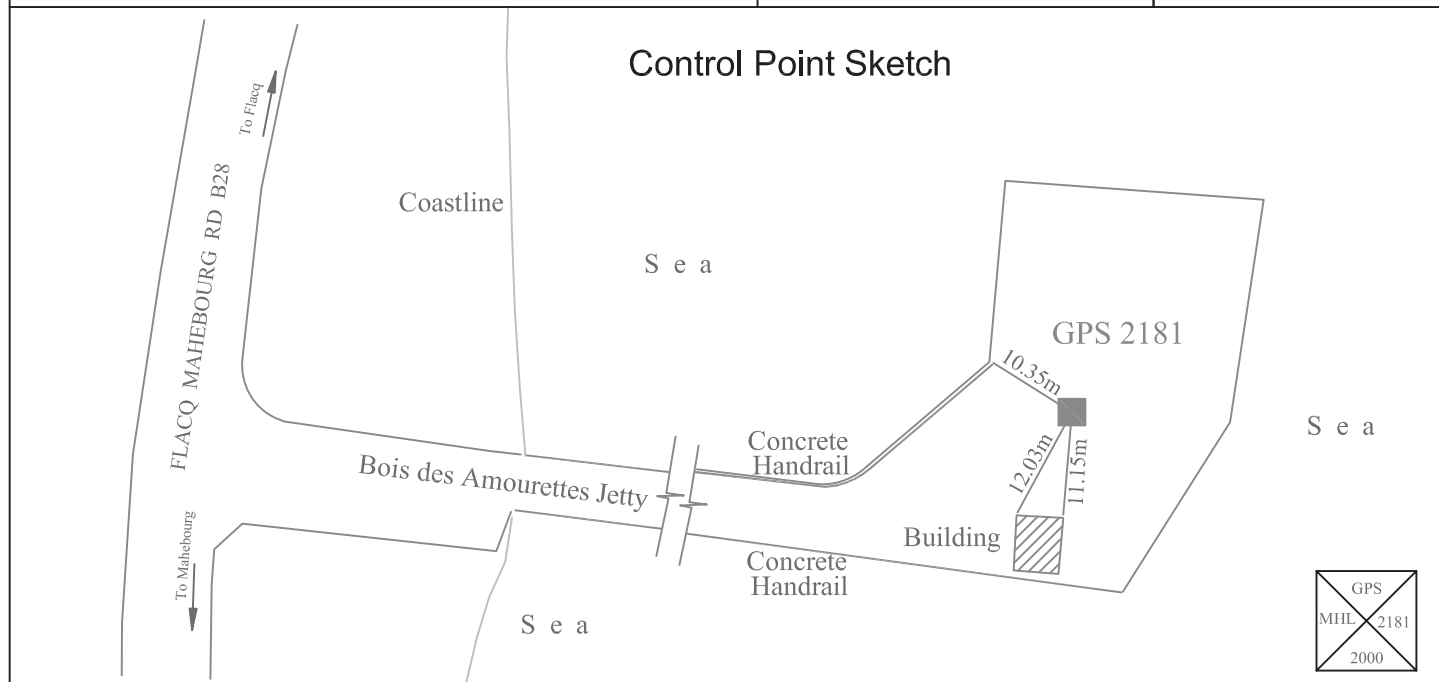
These surveys were carried out with 2 No Sokkia Geodetic Total Stations, namely the 650RX and Powerset 2010.

APPENDICES

APPENDIX A
STATIONS WITNESSING

STATION DESCRIPTION

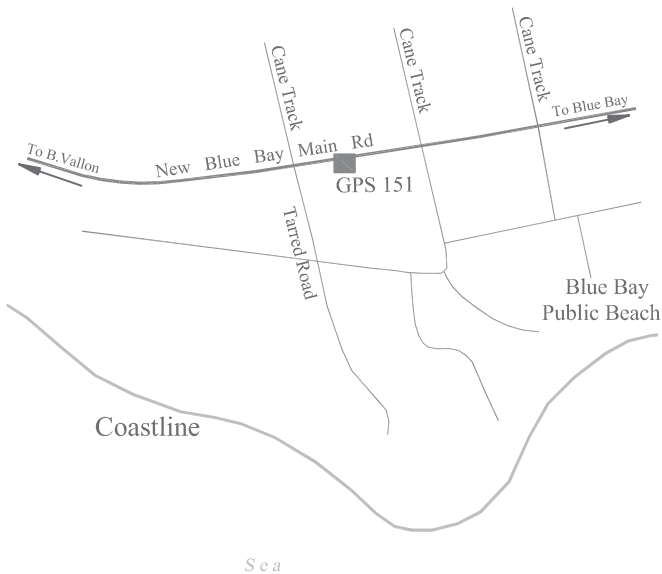
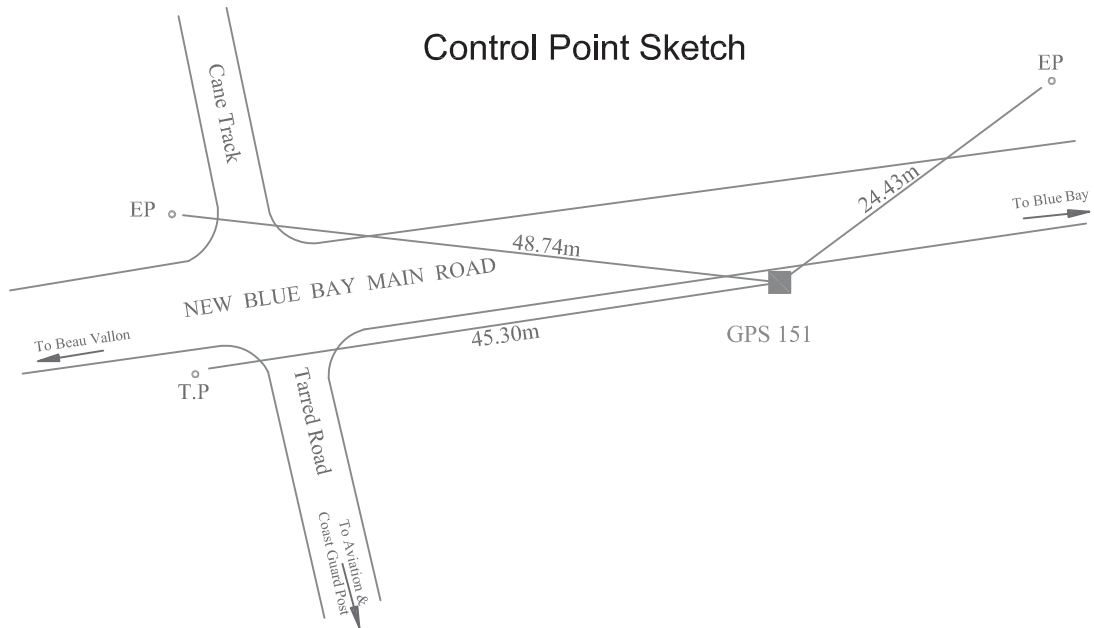
CONTROL POINT ID	GPS 2181	LATITUDE (d m s) GDM 2008	S20°22'06.57704"
		LONGITUDE (d m s)	E57°44'20.95206"
LOCATION	BOIS DES AMOURETTES	COORDINATES MGM 2008	577,139.42 mE 7,747,567.14 mN
SURVEY BLOCK	Secondary	COORDINATES LGM 2012	268,228.08 mE 339,697.07 mN
MARK	Brass bolt in concrete	COORDINATES LCO- LE POUCE GRID	1,021,958.44 mE 981,121.85 mN
DESCRIBED BY	Cadastre Unit	HEIGHT (amsl)	1.491 m
REMARKS: Brass Bolt in Concrete slab, good condition		ELLIPSOIDAL HEIGHT	-2.002 m
DATE:	09.05.11		



STATION DESCRIPTION

CONTROL POINT ID	GPS 151	LATITUDE (d m s) GDM 2008	S20°26'28.99151"
		LONGITUDE (d m s)	E57°42'37.47569"
LOCATION	BLUE BAY	COORDINATES MGM 2008	574,104.71 mE 7,739,513.18 mN
SURVEY BLOCK	Secondary	COORDINATES LGM 2012	265,220.12 mE 331,630.07 mN
MARK	Brass bolt in concrete	COORDINATES LCO- LE POUCE GRID	1,018,948.24 mE 973,055.80 mN
DESCRIBED BY	Cadastre Unit	HEIGHT (amsl)	10.699 m
REMARKS: Brass Bolt in Concrete slab, good condition		ELLIPSOIDAL HEIGHT	6.769 m
		DATE: 09.05.11	

Control Point Sketch





Control Station CP1 on Jetty, Blue Bay



CP2 @ 7.50m from
kiosk

Control Station CP2 at Kiosk, Blue Bay



Control Station CP3 on Groyne



Control Station CP4 on Groyne



CP5: Steel peg in concrete

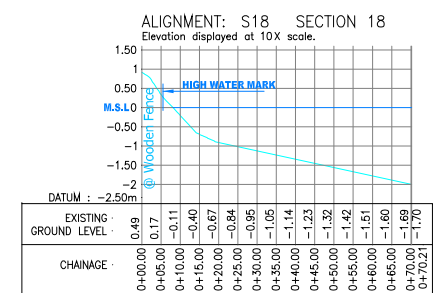
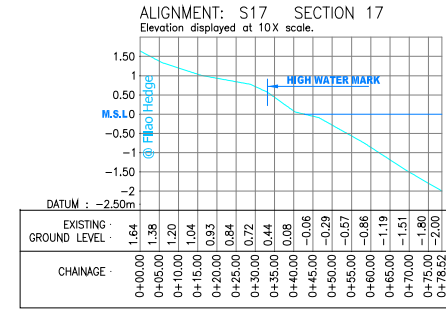
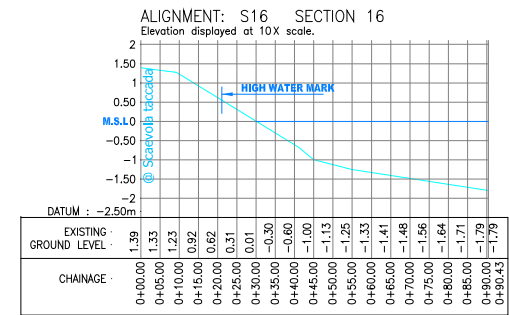
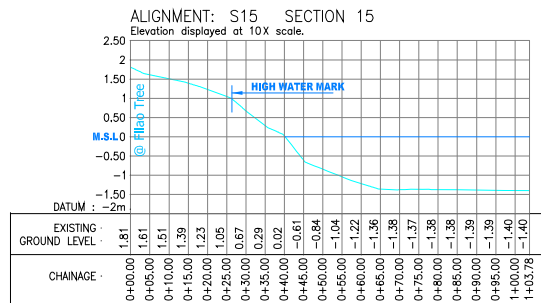
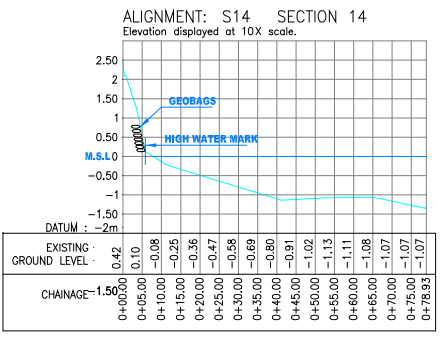
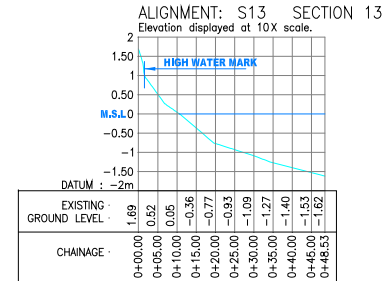
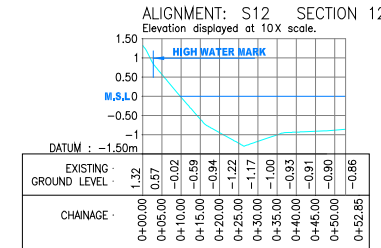
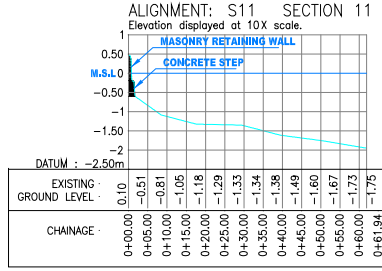
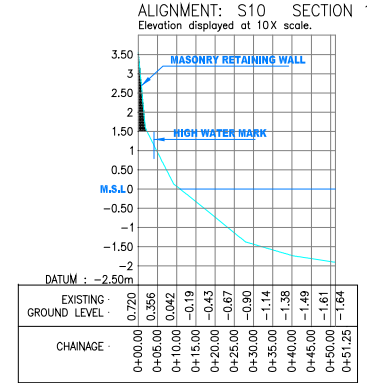
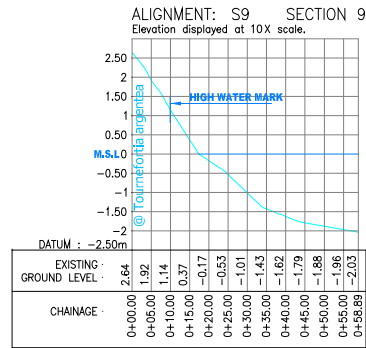
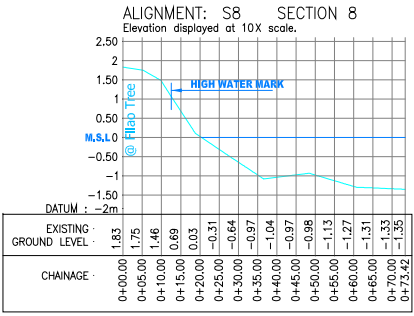
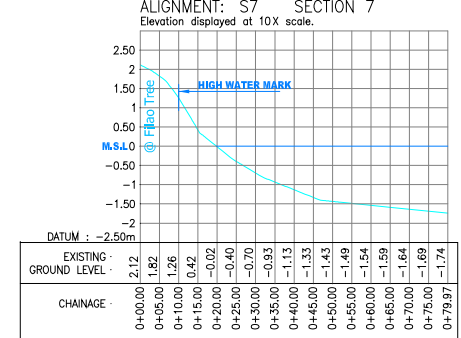
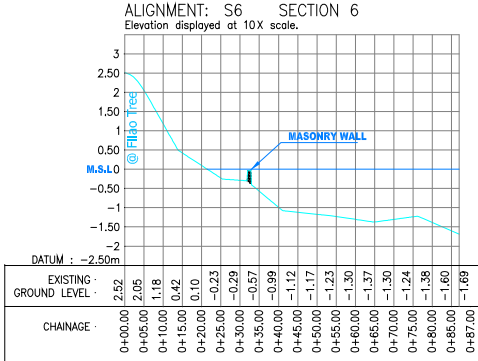
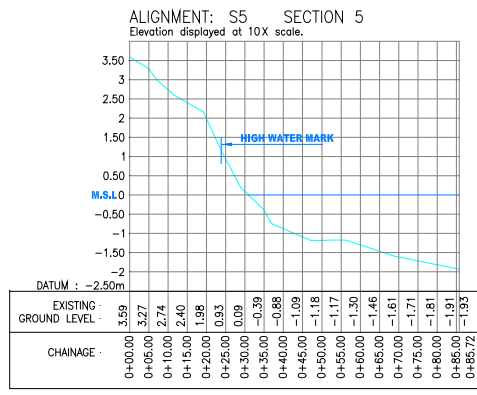
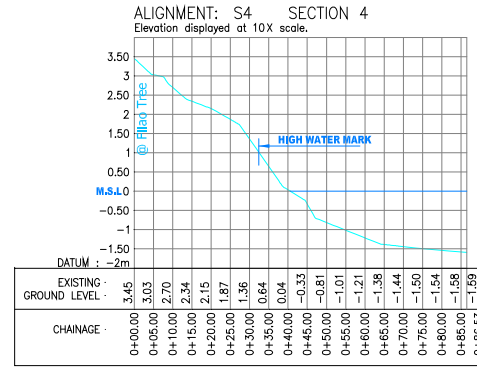
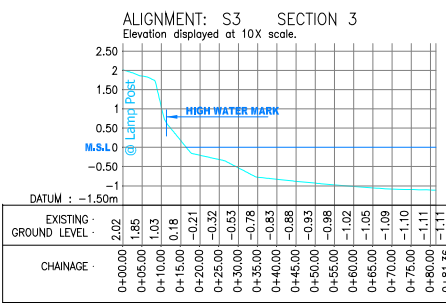
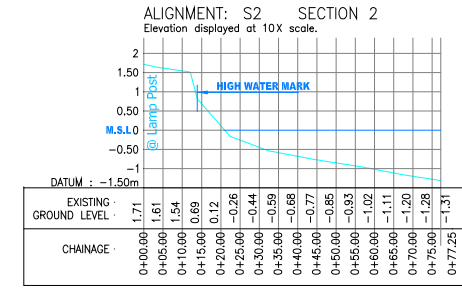
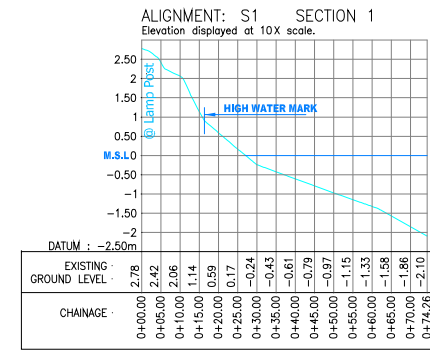
Control Station CP5 on Groyon



CP6: Steel peg in concrete

Control Station CP6 on Groyon

APPENDIX B
DRAWINGS



THIS DRAWING IS NOT TO BE USED IN WHOLE OR IN PART OTHER THAN FOR THE INTENDED PURPOSE AND PROJECT. REFER TO THE CONTRACT FOR FULL TERMS AND CONDITIONS

GENERAL NOTES:

REVISIONS

NO.	DATE	DETAILS	CH	CK	AP

CLIENT

KOKUSAI KOGYO Co. Ltd

PROJECT
SURVEY ON COASTAL PROTECTION SITES
POINTE D'ESNY SITE

STAGE

SURVEY

DRAWING TITLE
CROSS SECTIONS

SCALE
HOR: 1:1000, VERT: 1:100 @ A1

DATE
AUGUST 2013

DRAWING NO.
M158/PE/01

SURVEYED / DRAWN / CHECKED / REVIEWED
TCC / VM / AR

CONSULTING ENGINEER
GIBB

GIBB (MAURITIUS) LTD
GIBB HOUSE
71, SAYED HOSSEN ROAD, SOLFERINO MAURITIUS
PHONE : +230 402 1900
FAX : +230 427 6800
EMAIL : gibb@intnet.mu

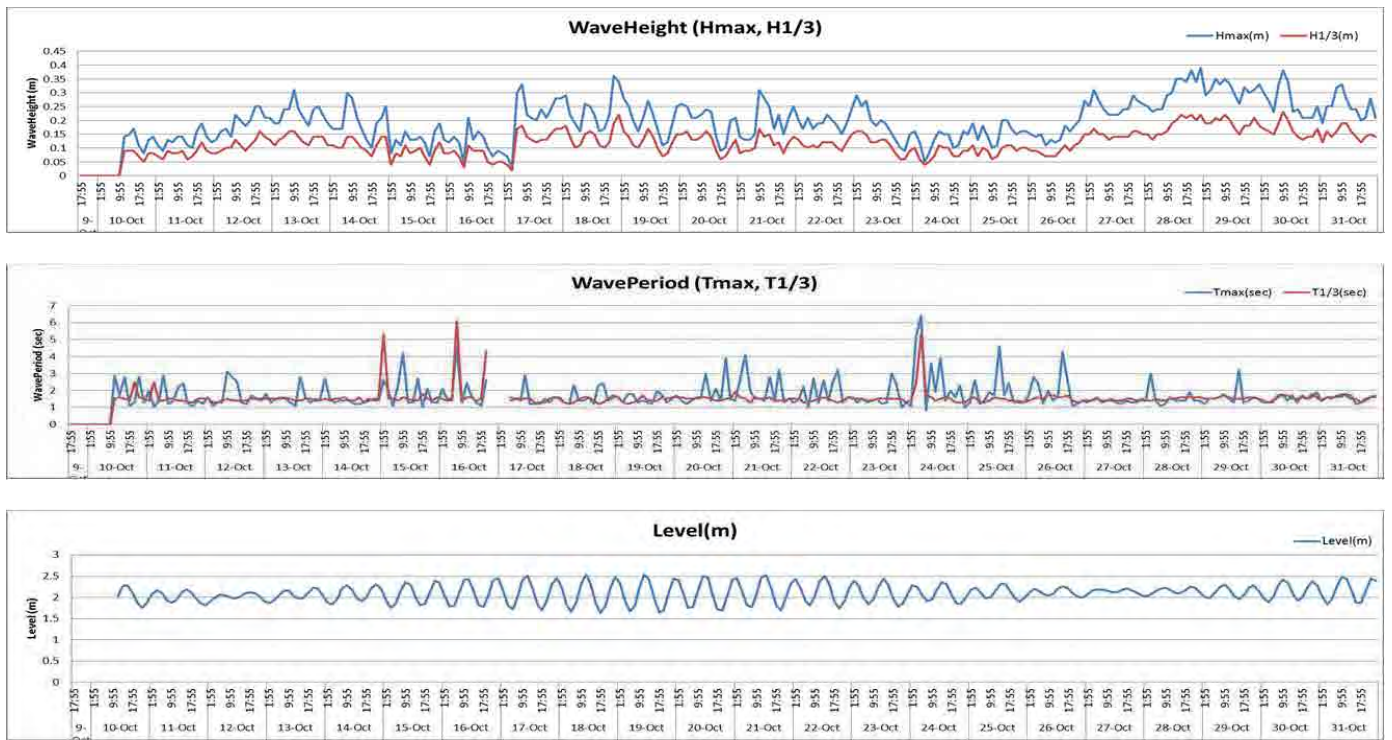
APPENDIX C

CD

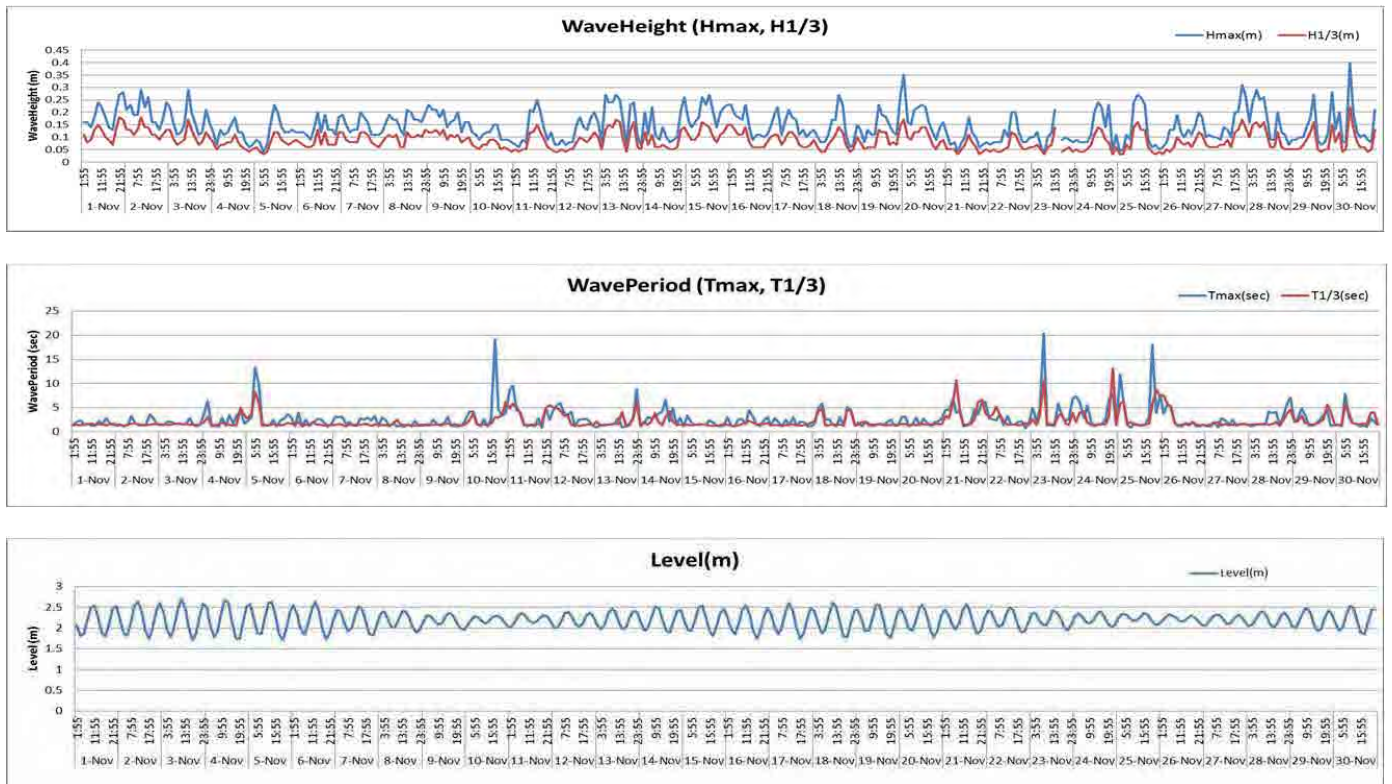
9. Wave Observation Data

Full Recording Period Wave Data for Grand Sable. (October 2013 – September 2014).

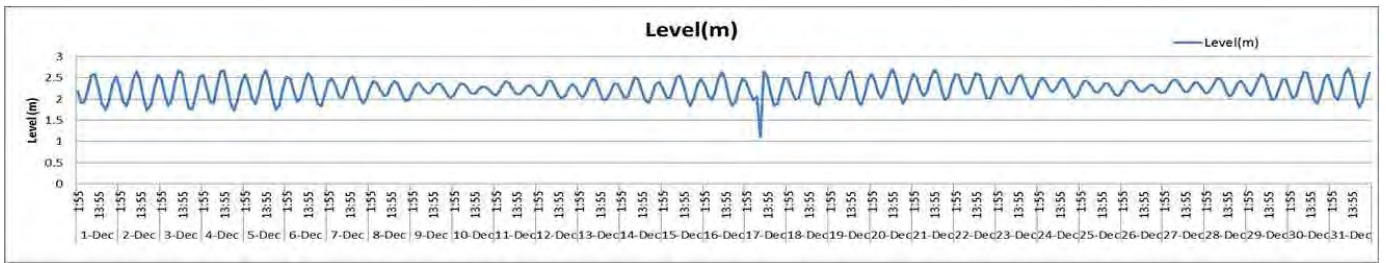
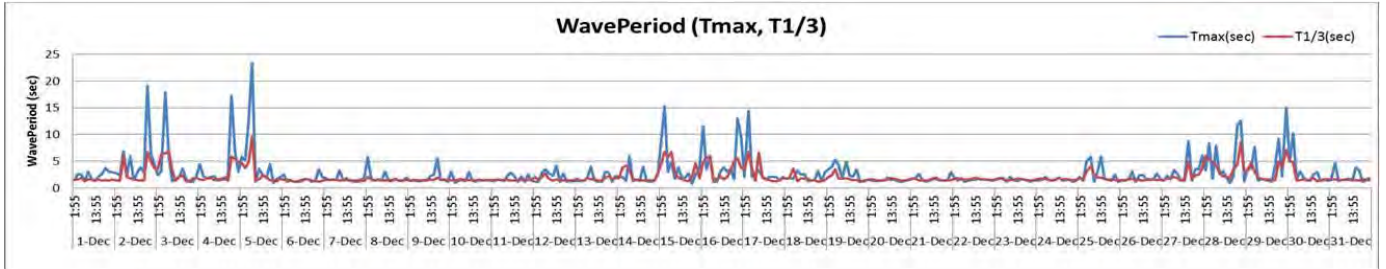
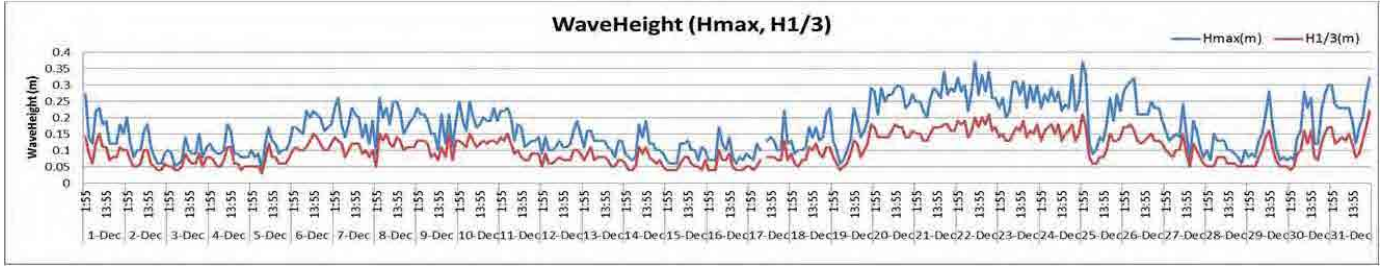
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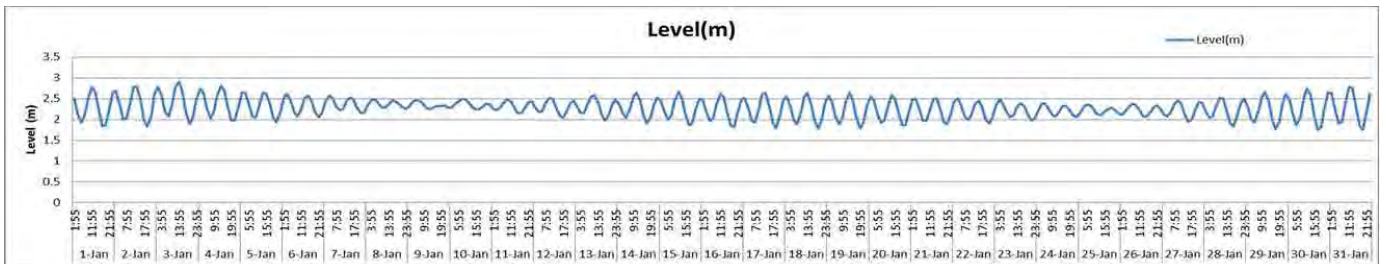
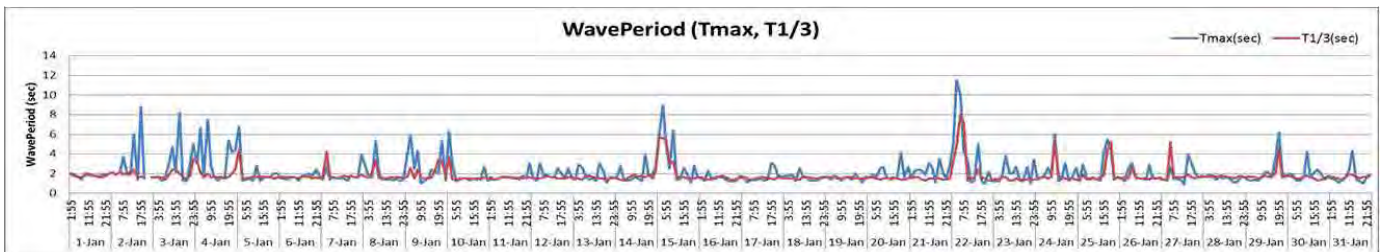
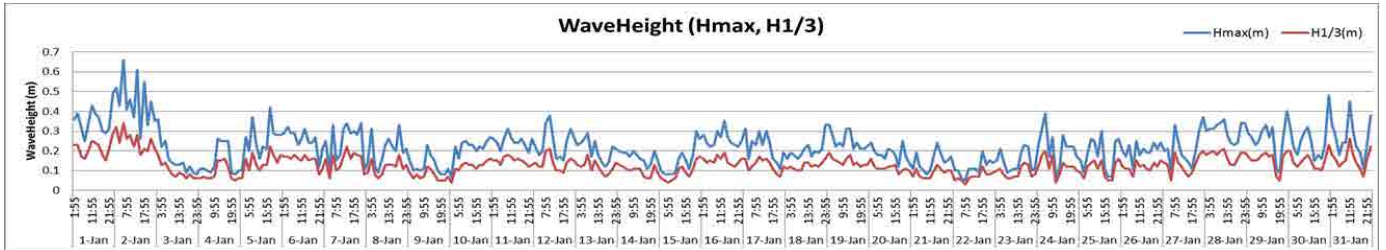
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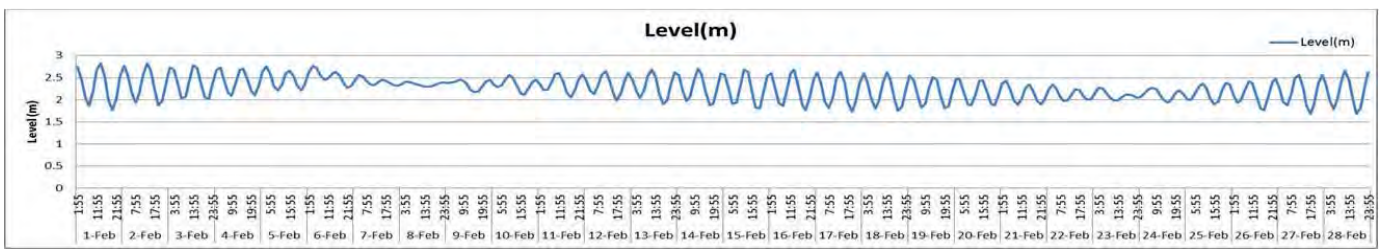
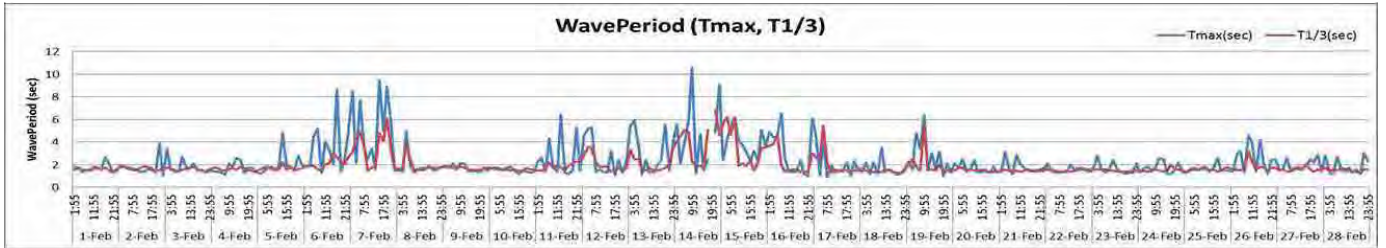
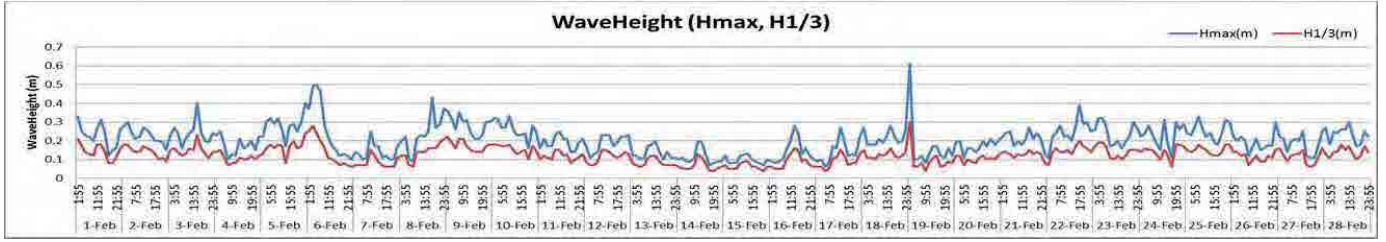
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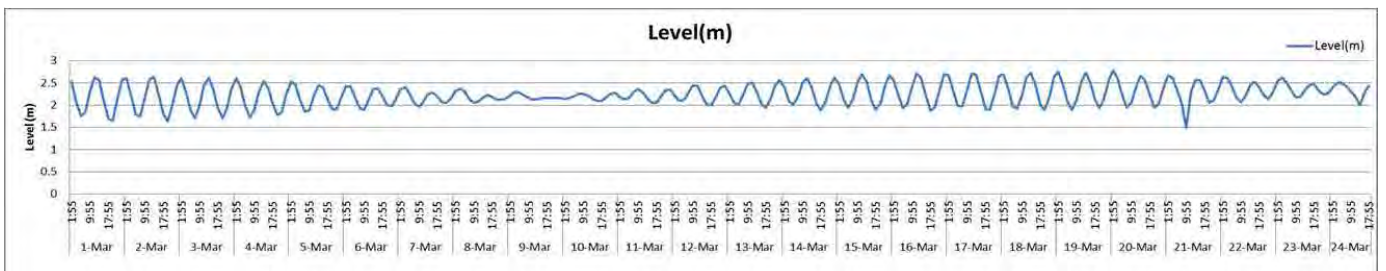
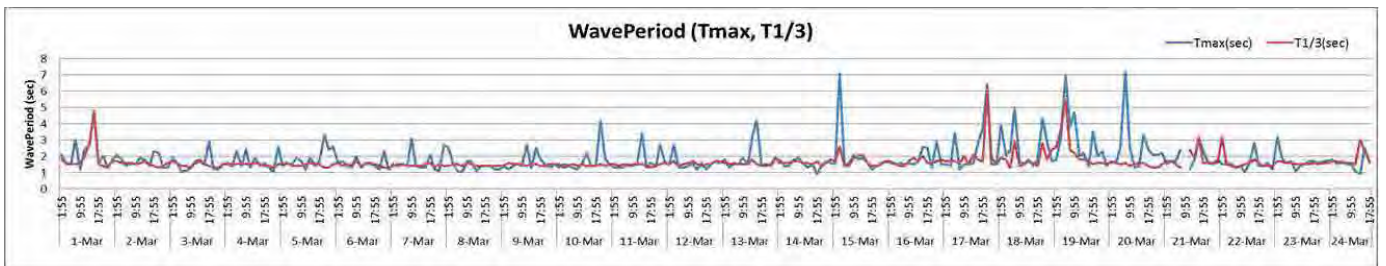
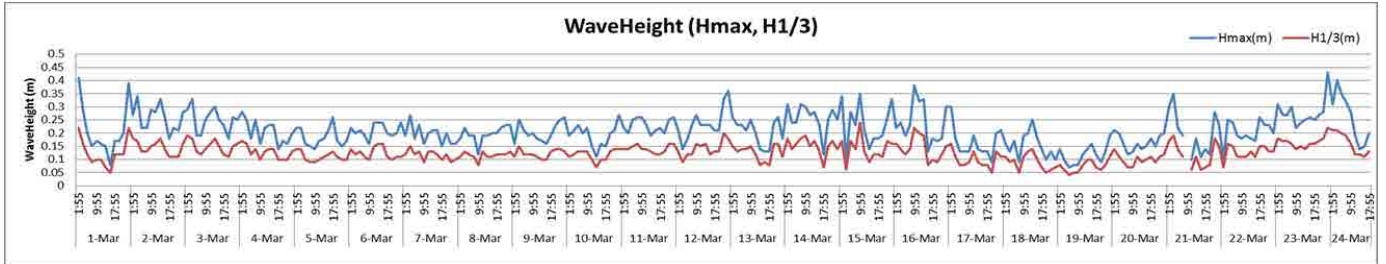
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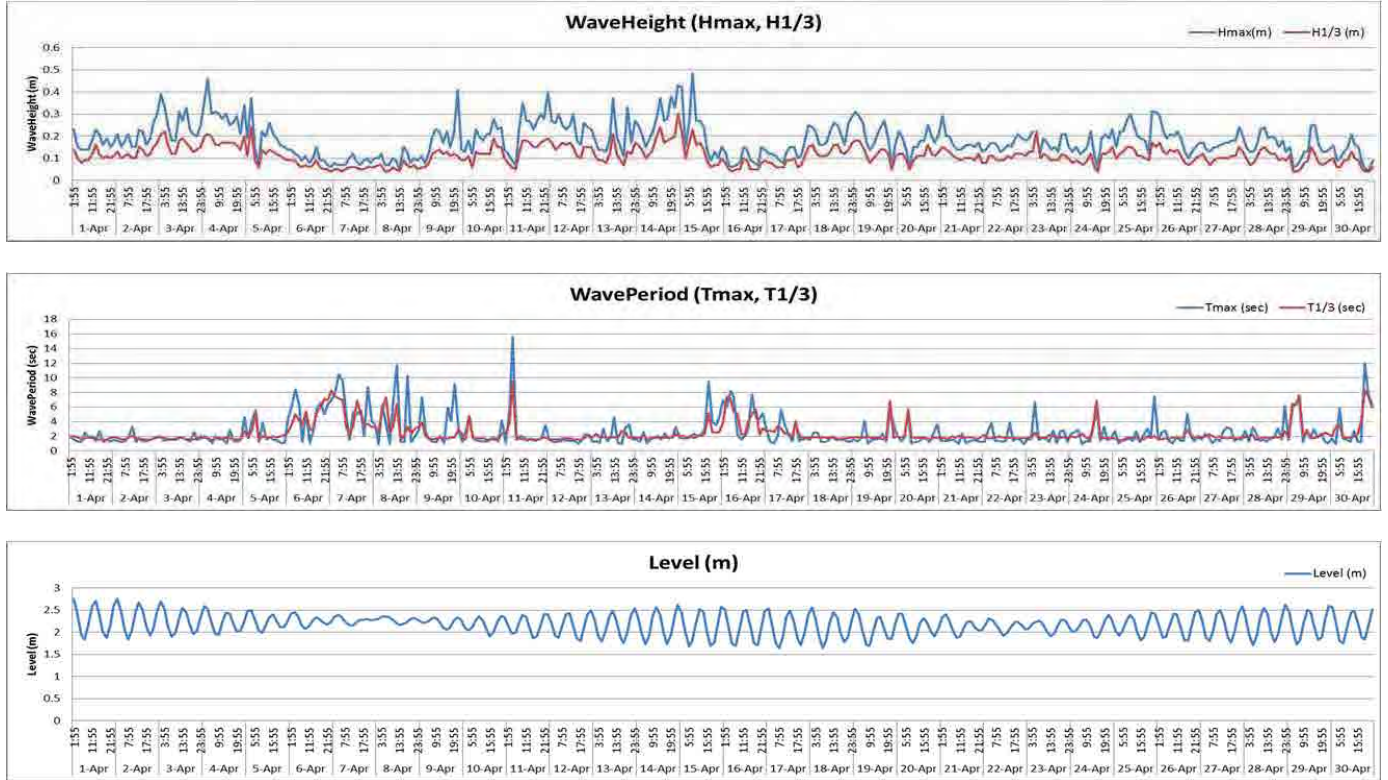
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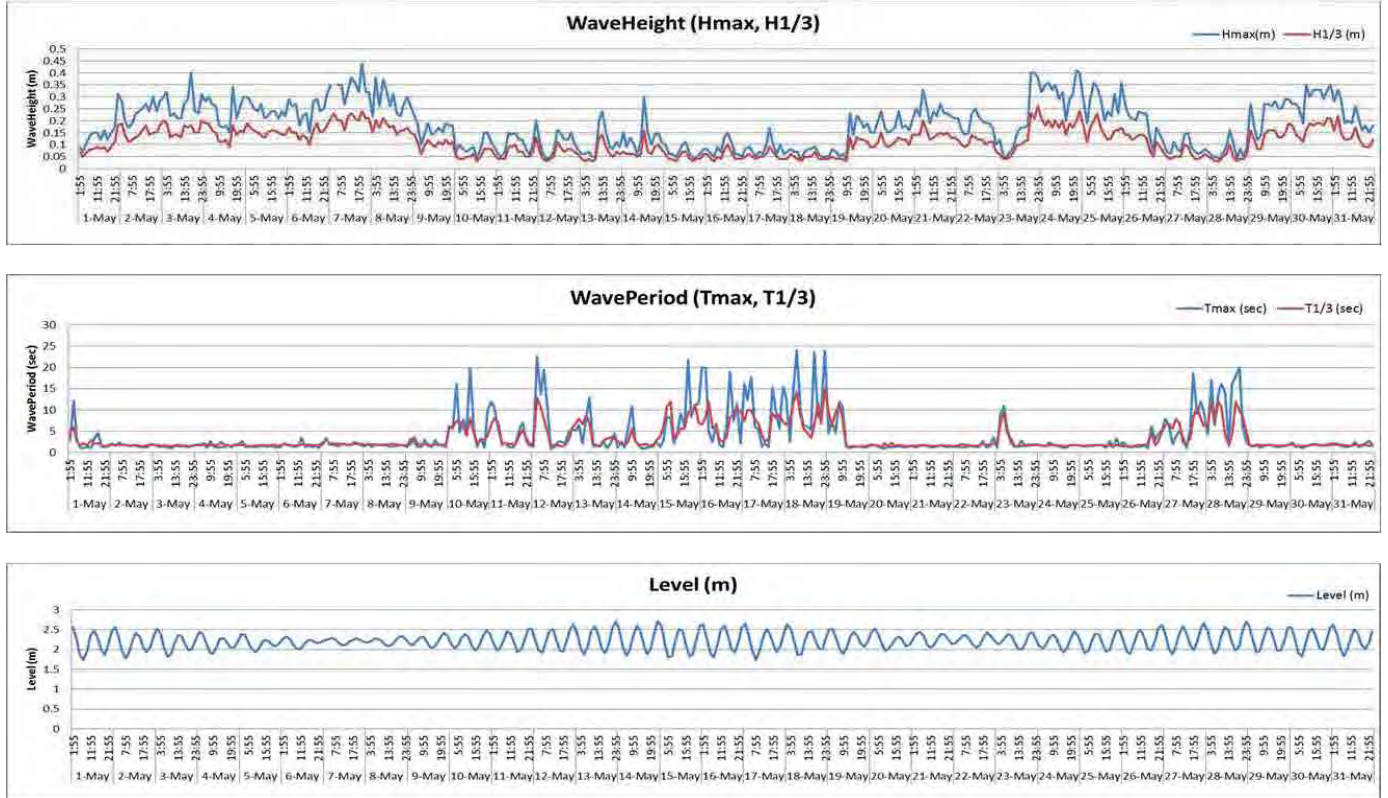
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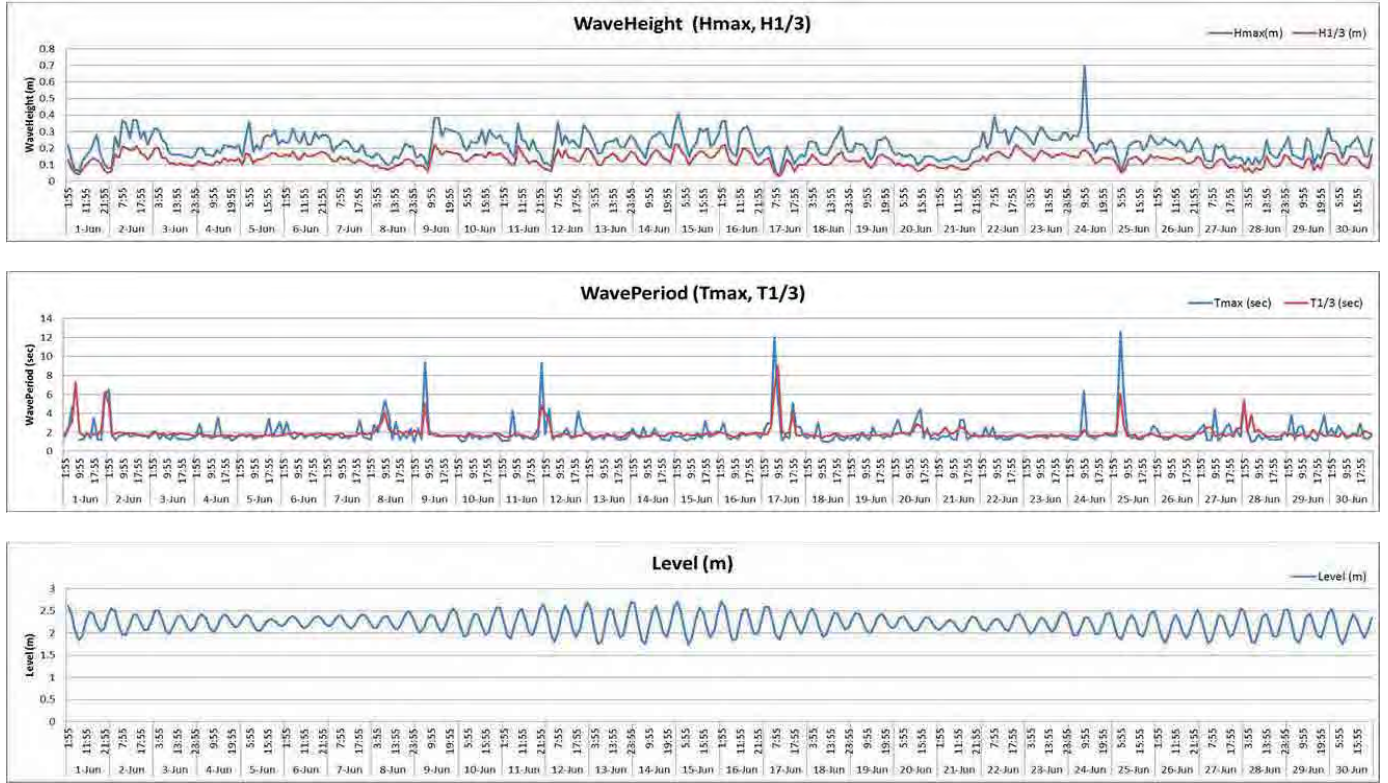
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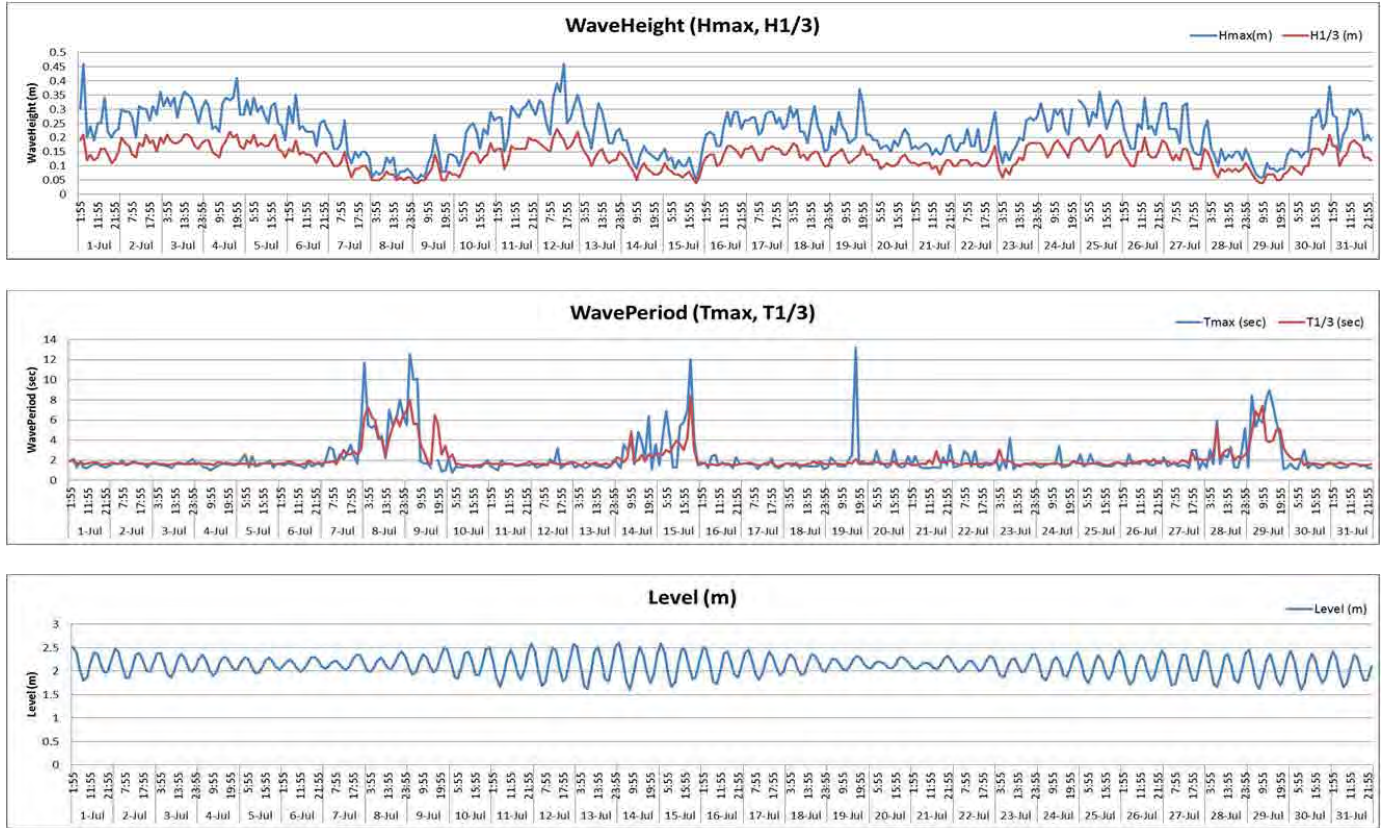
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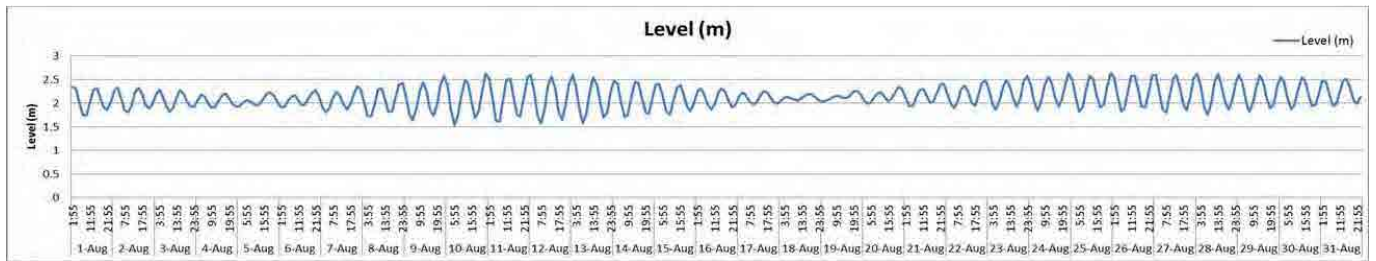
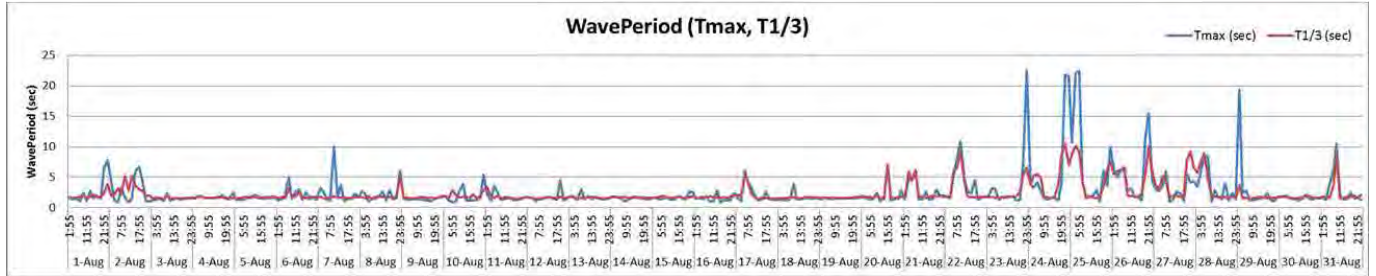
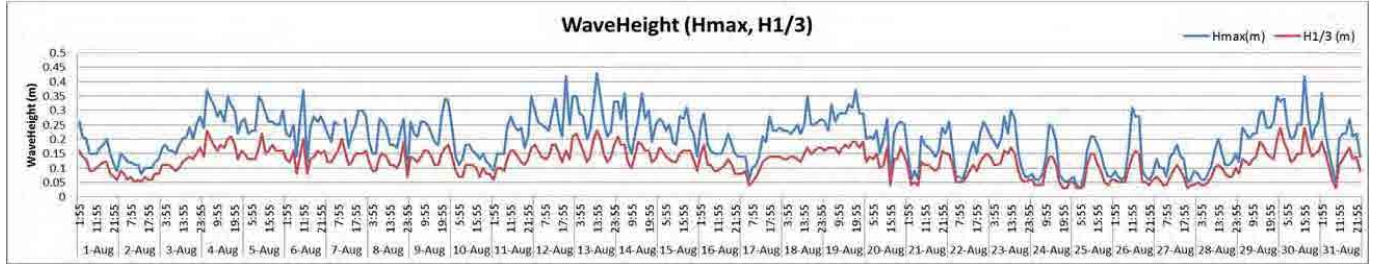
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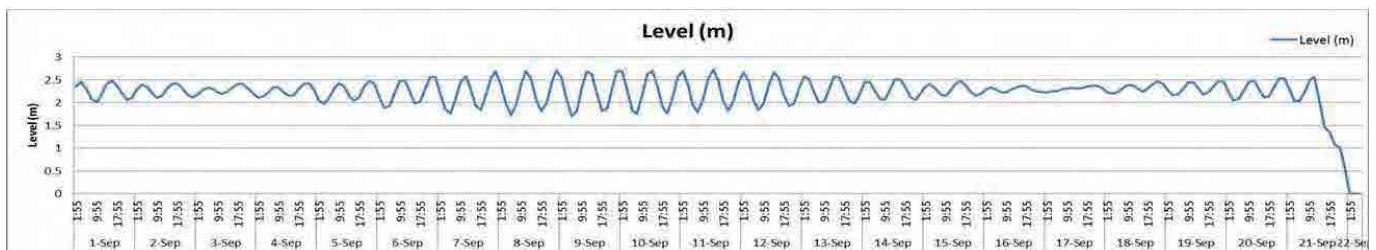
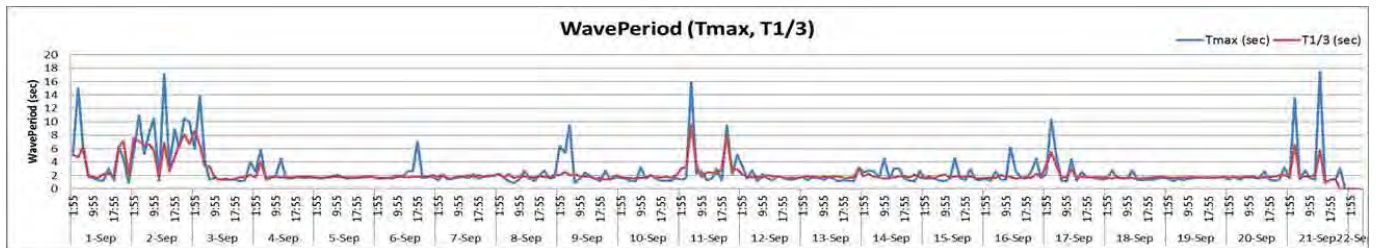
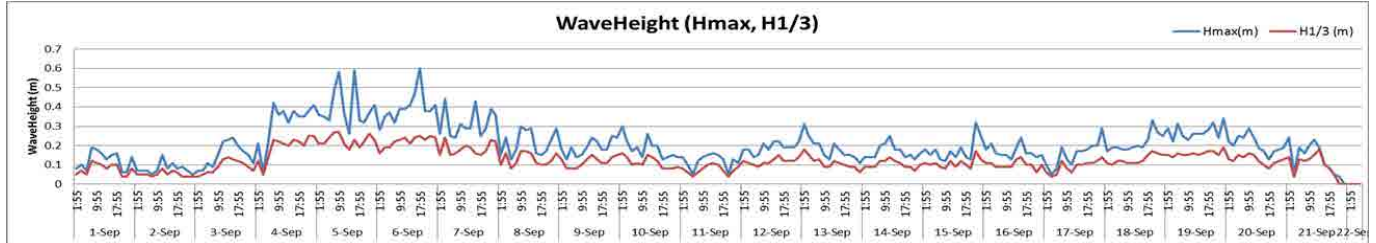
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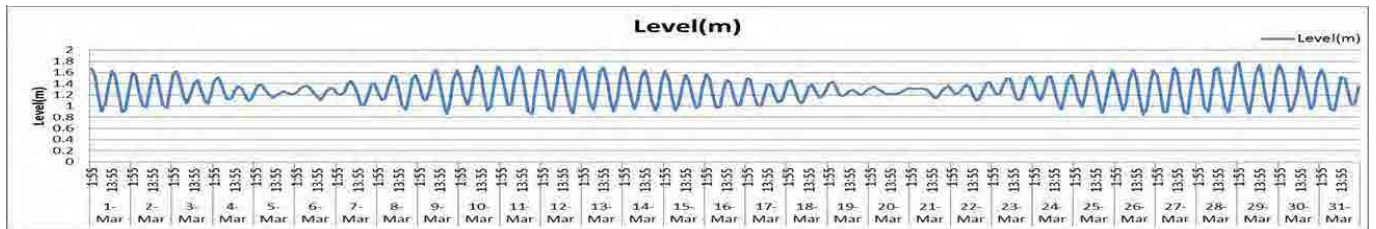
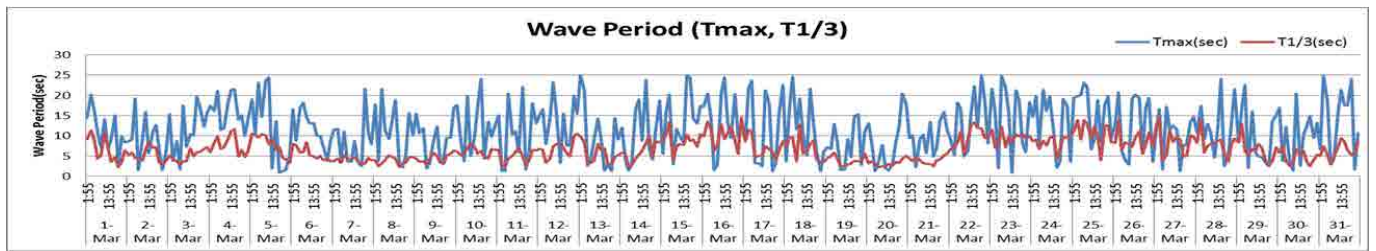
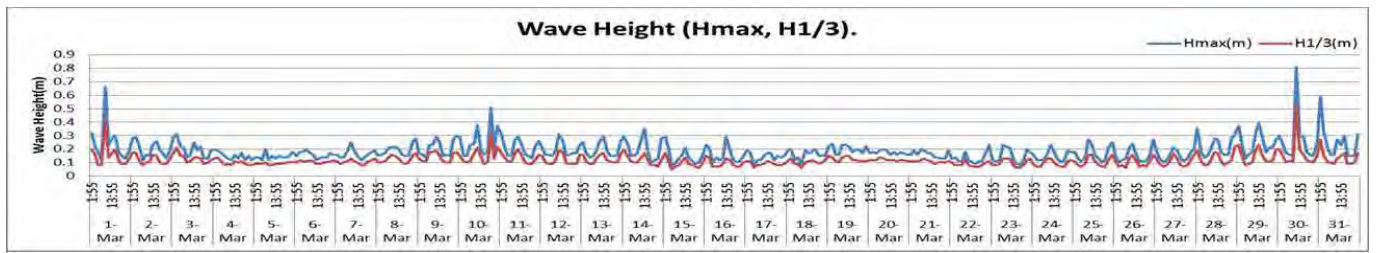


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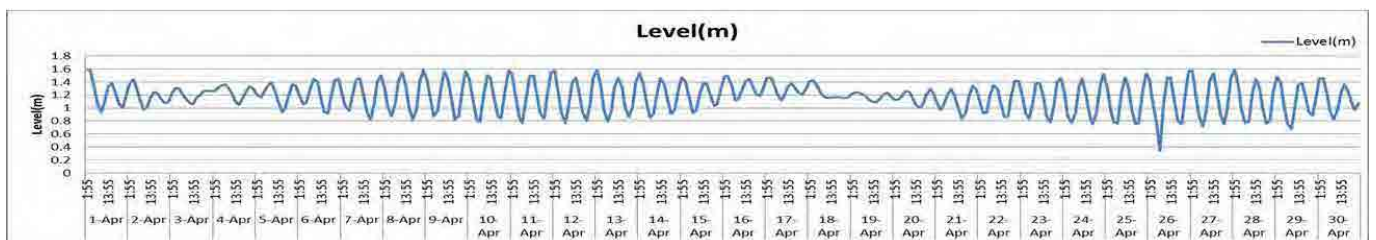
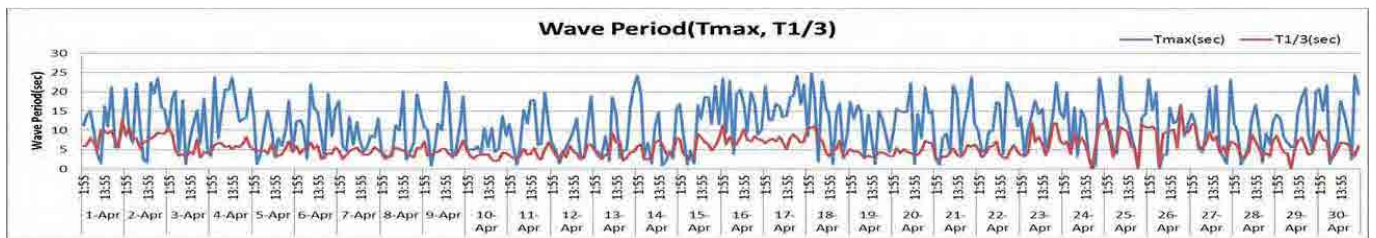
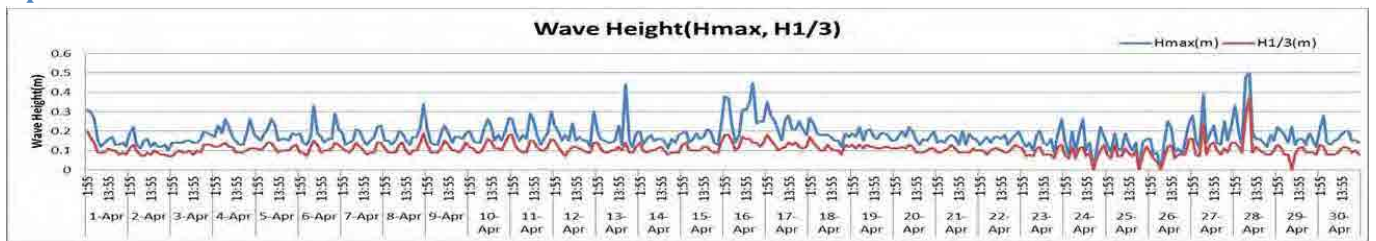


Full Recording Period Wave Data for Pointe D'Esny. (March 2013 – September 2014).

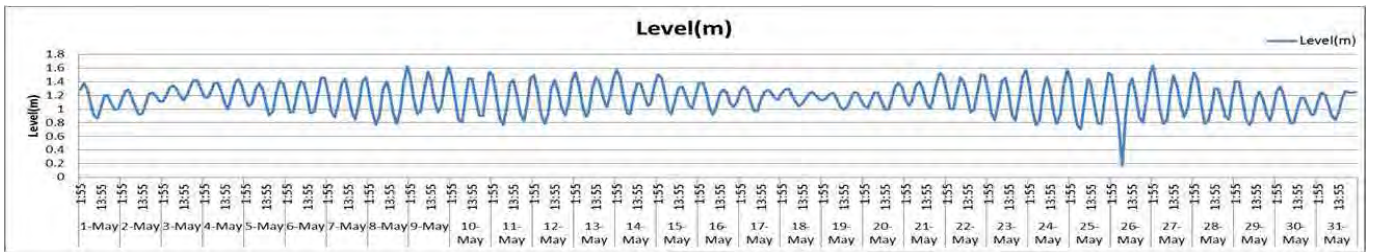
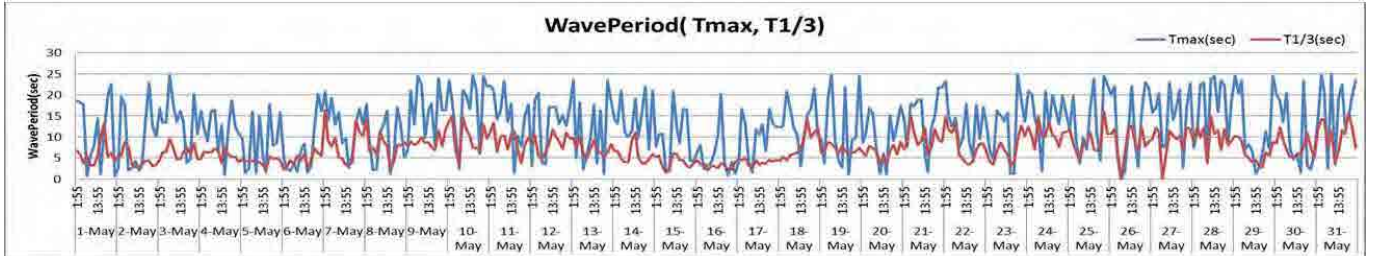
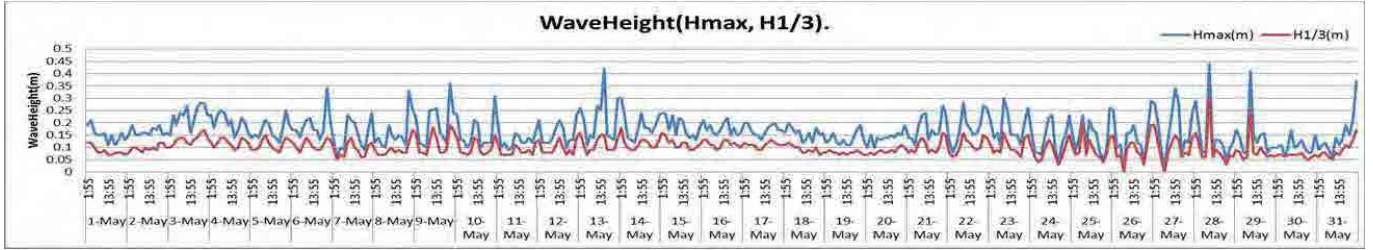
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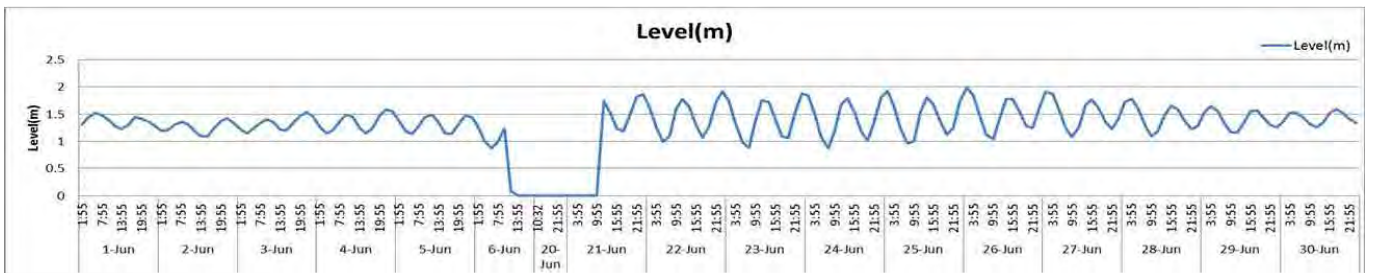
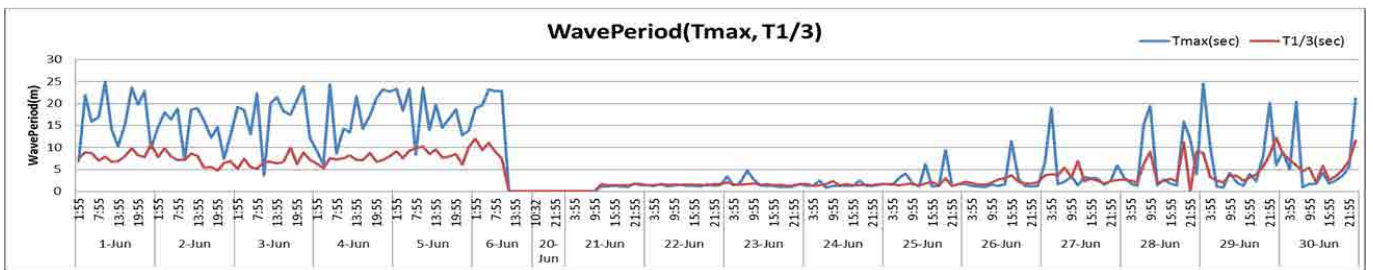
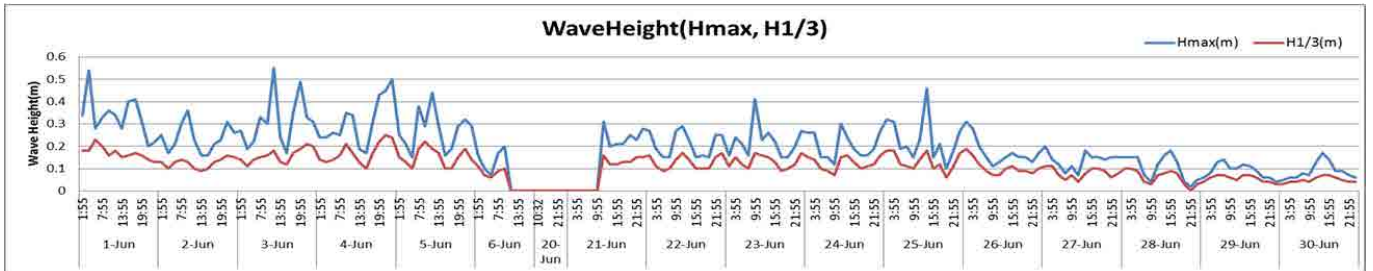
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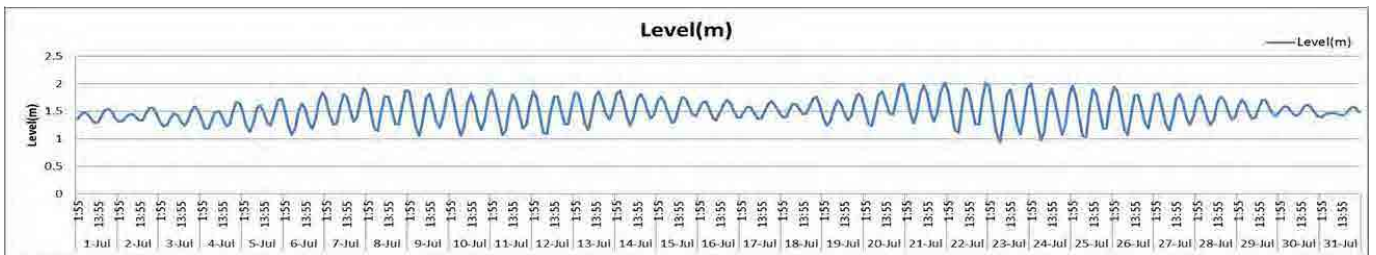
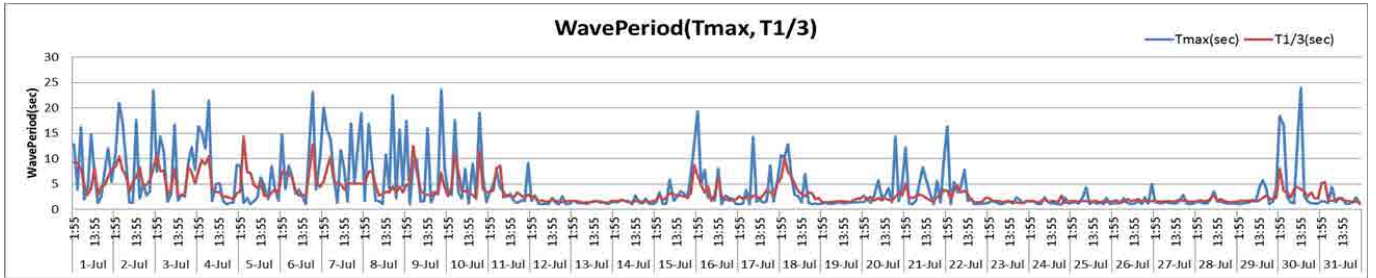
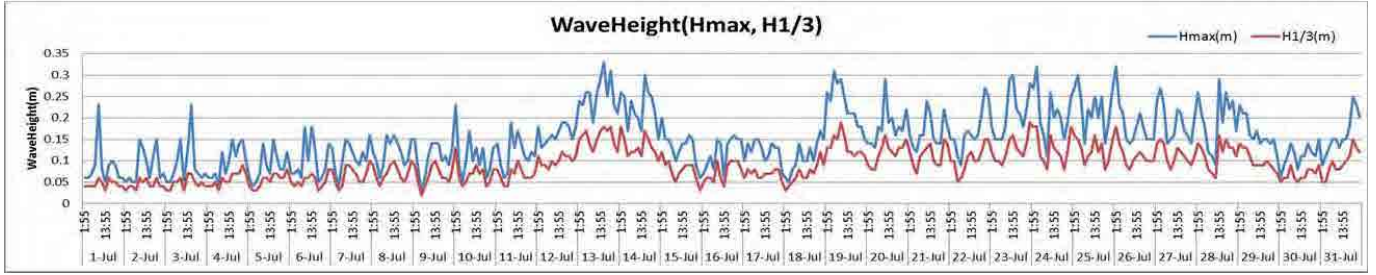
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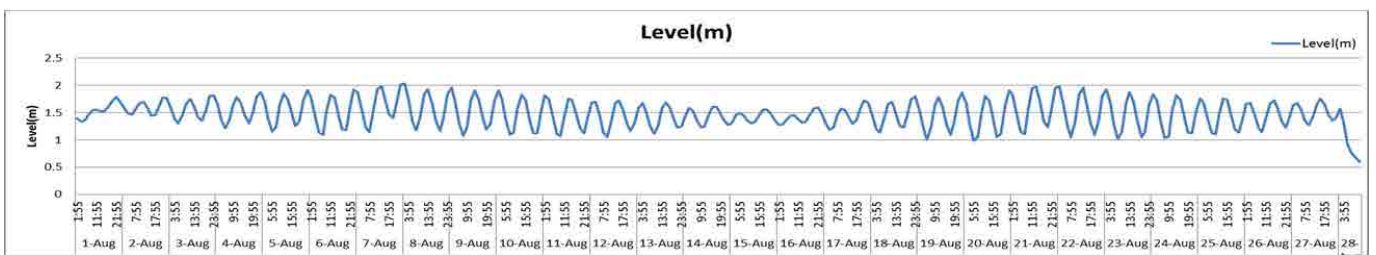
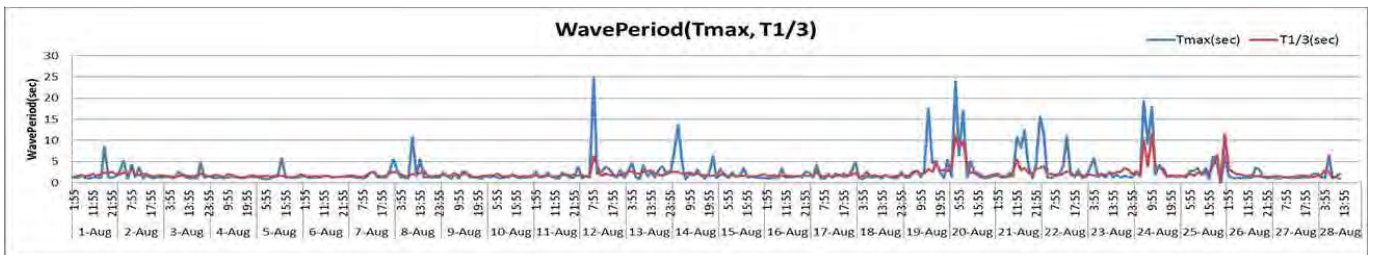
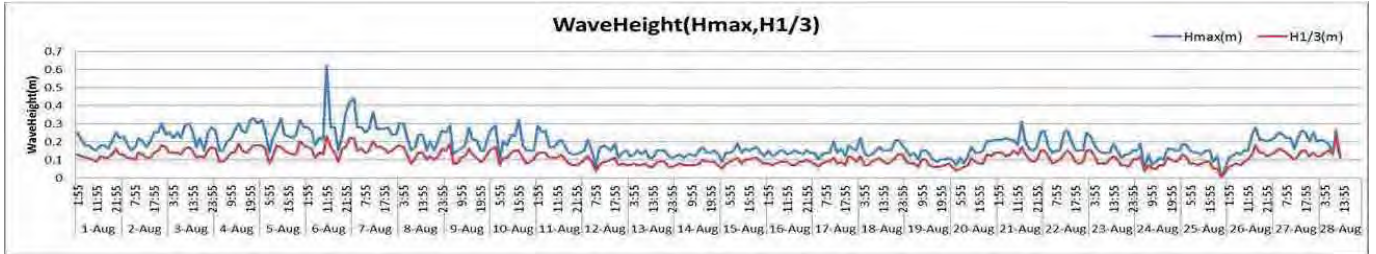
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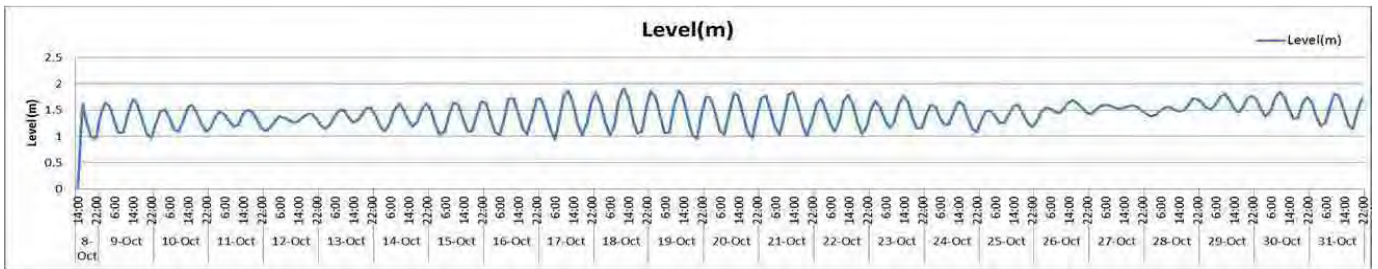
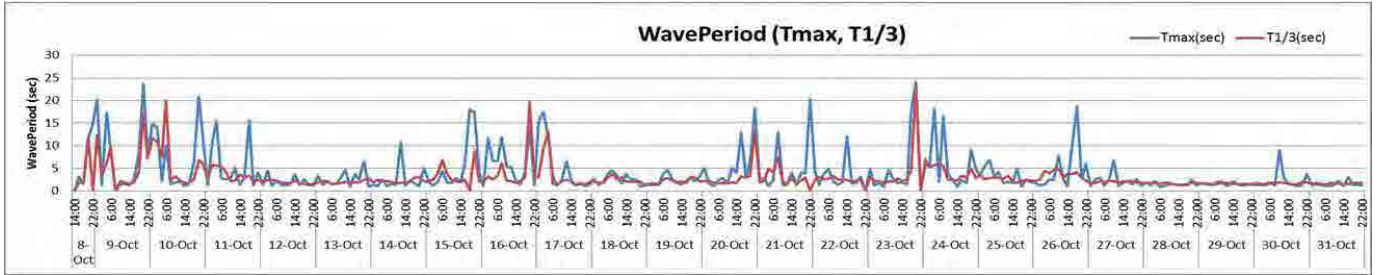
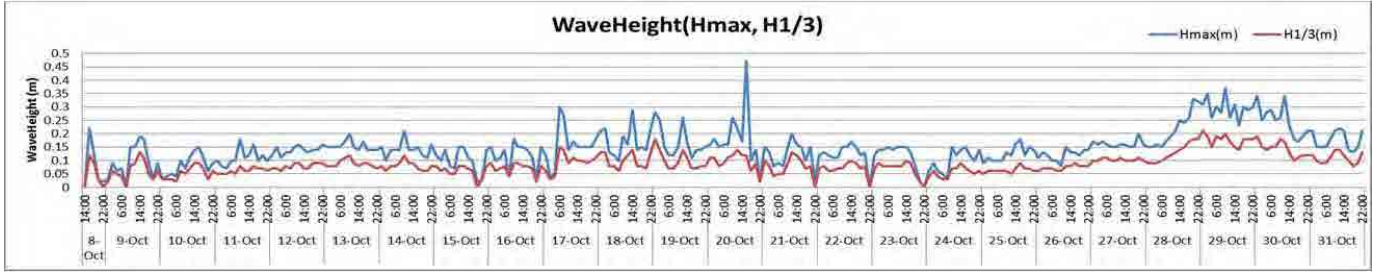
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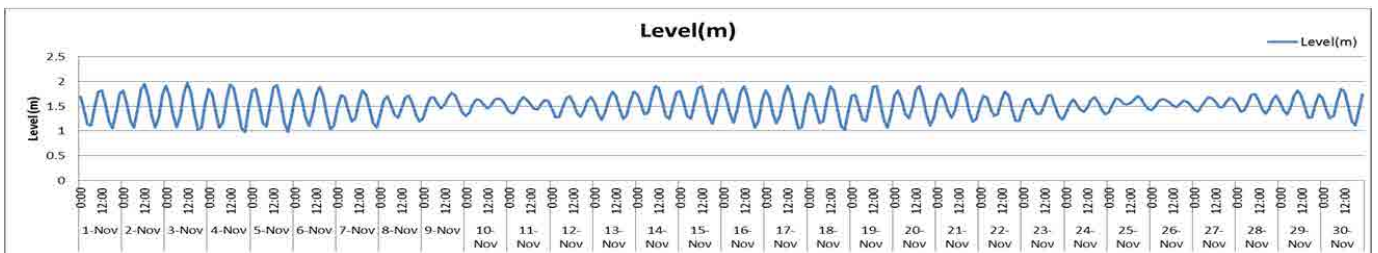
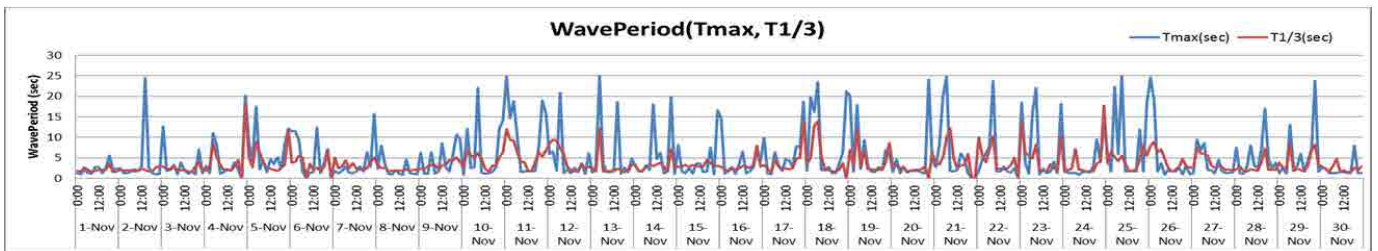
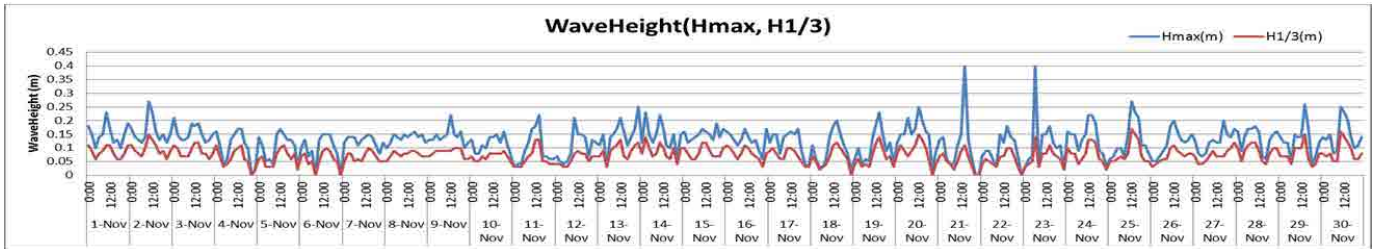
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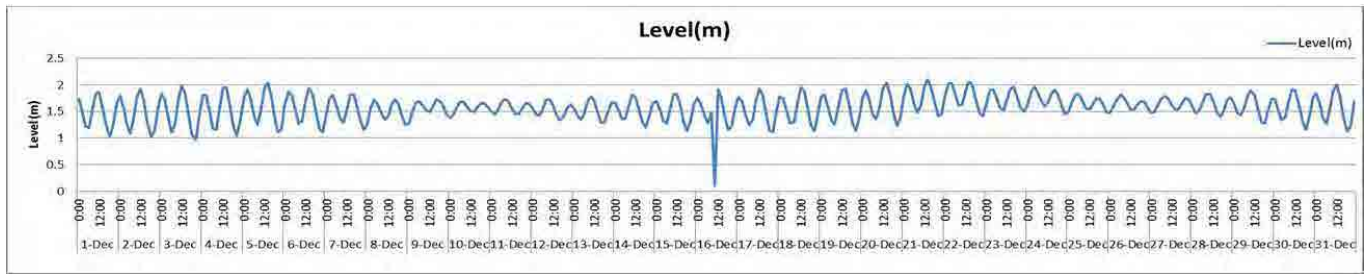
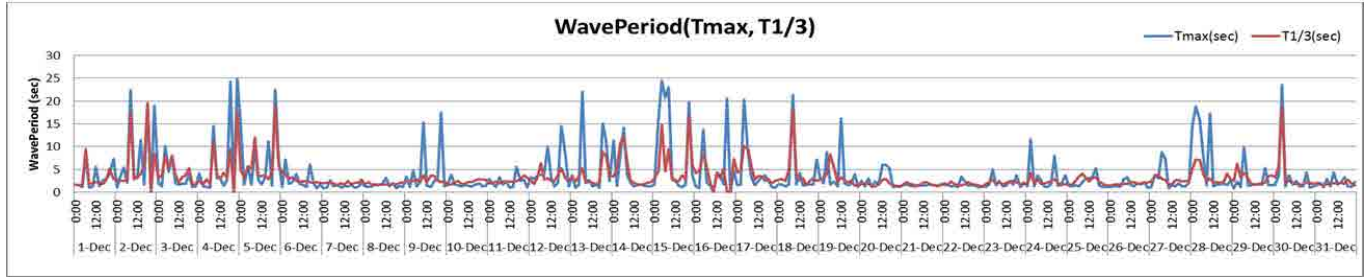
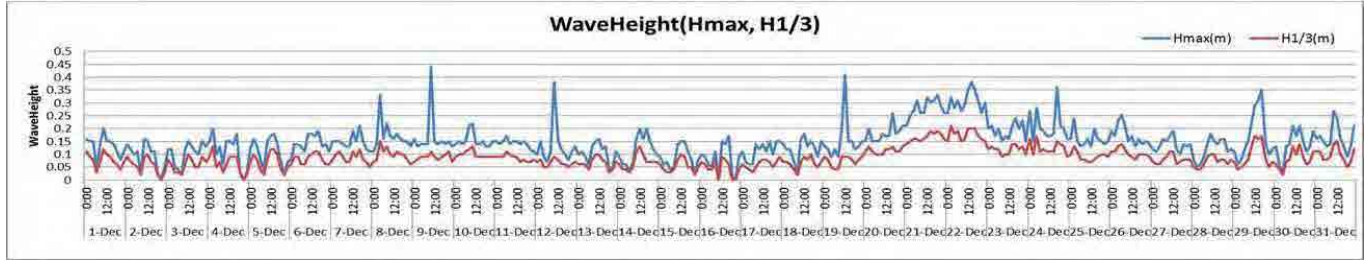
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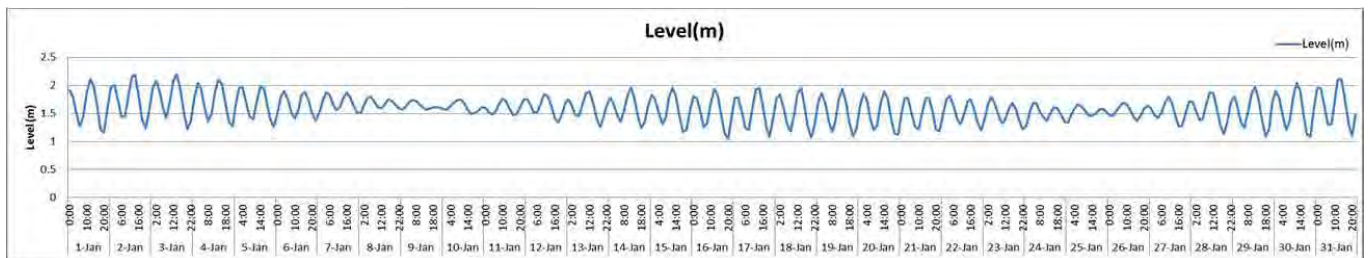
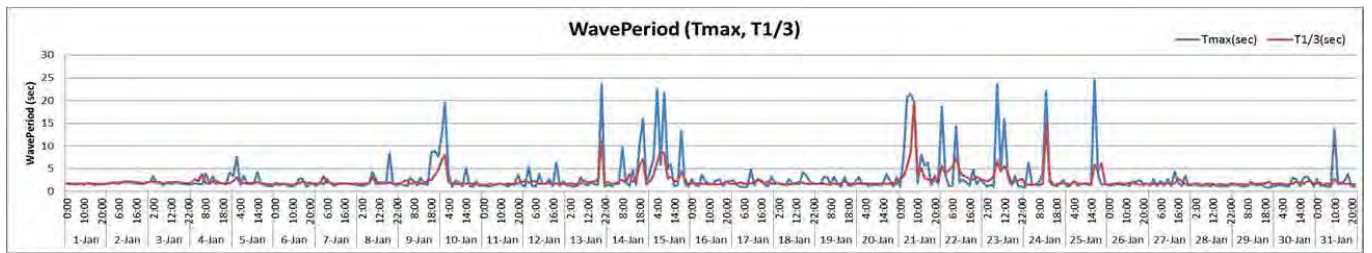
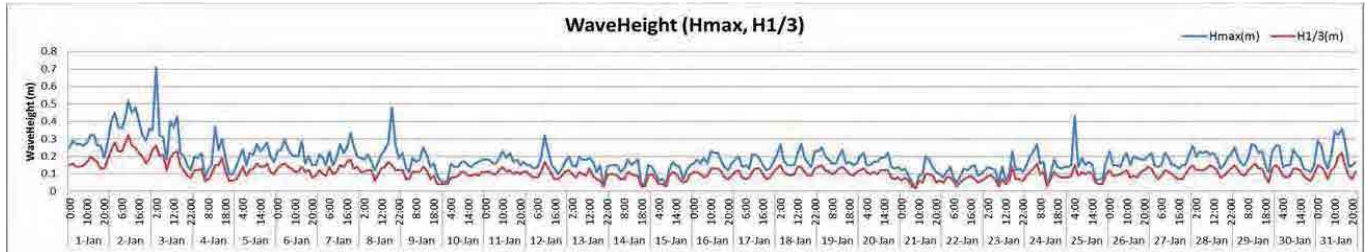
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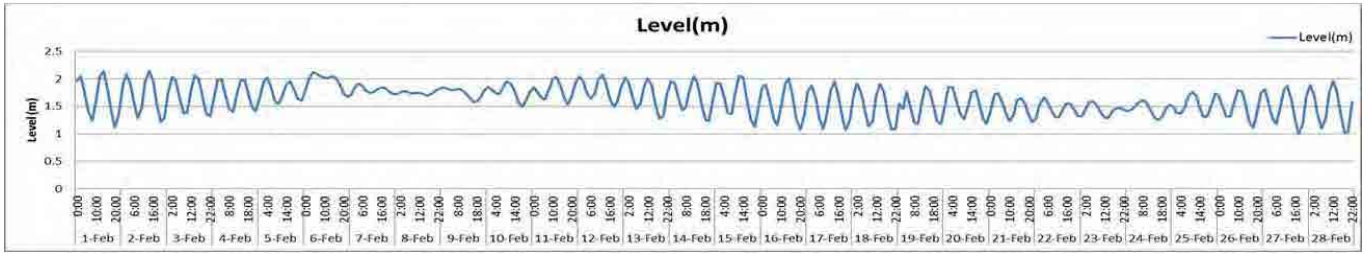
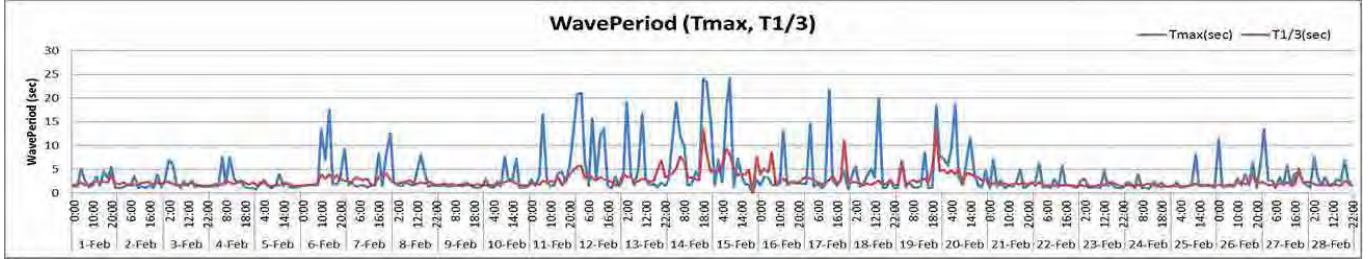
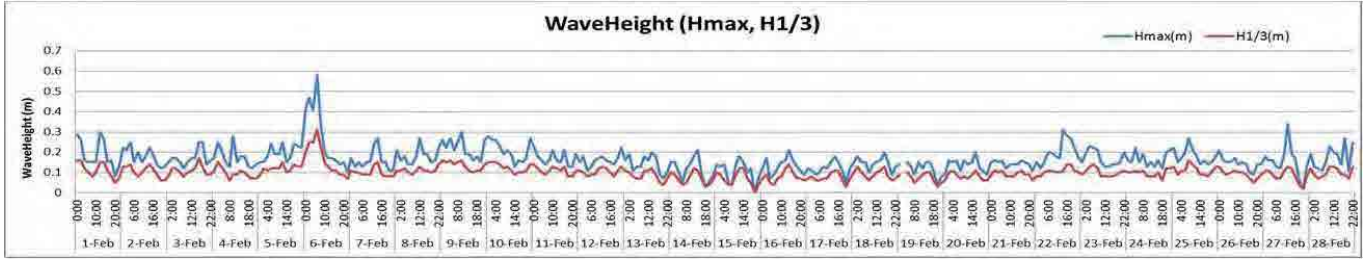
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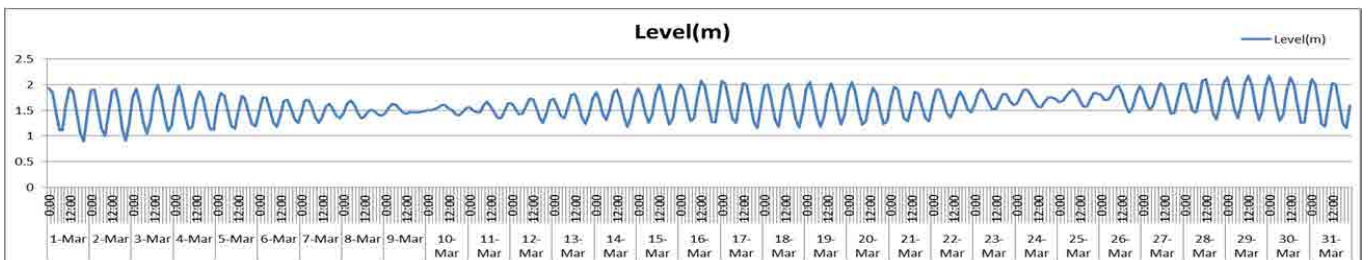
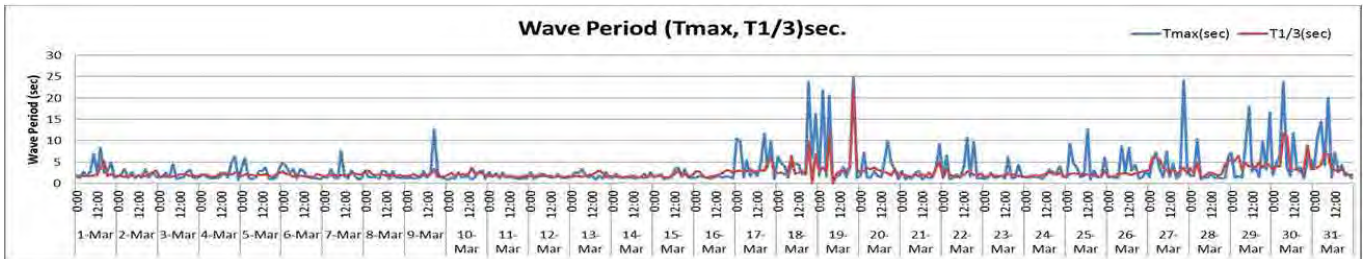
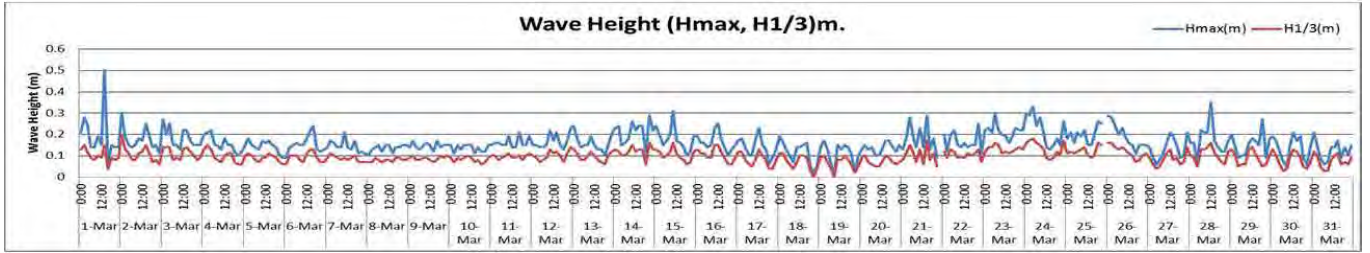
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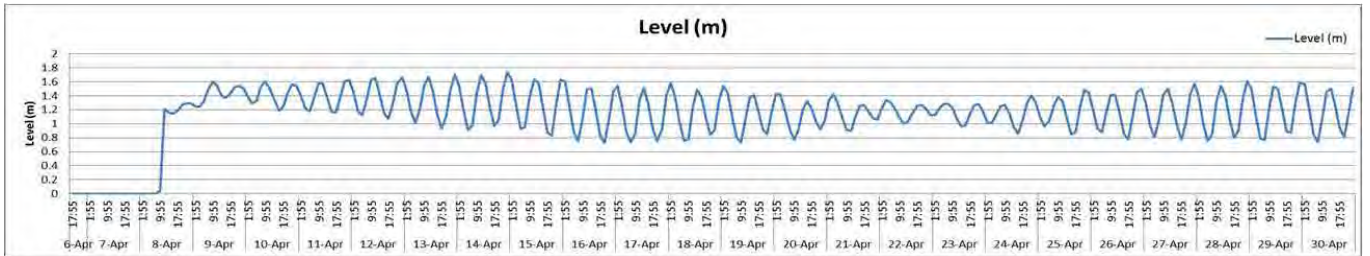
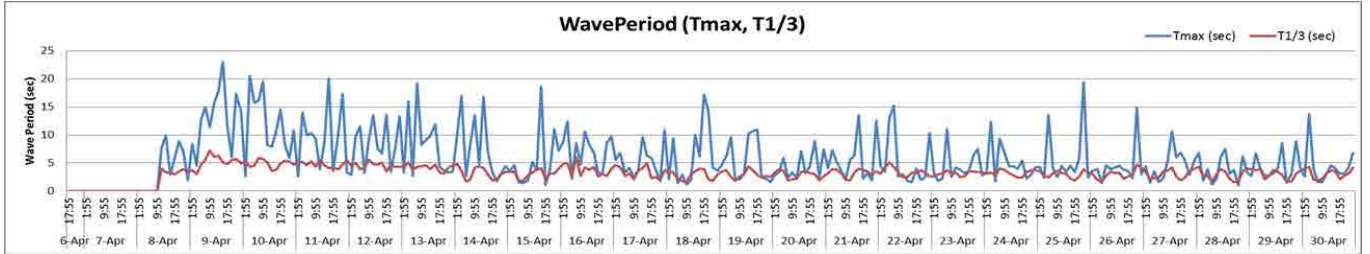
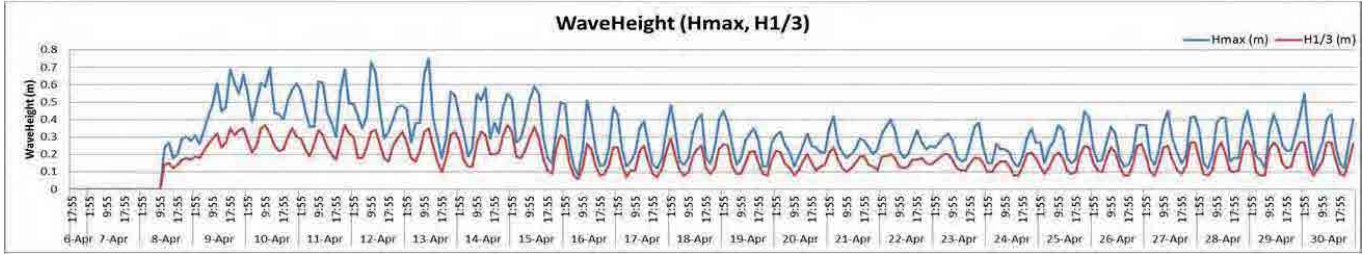
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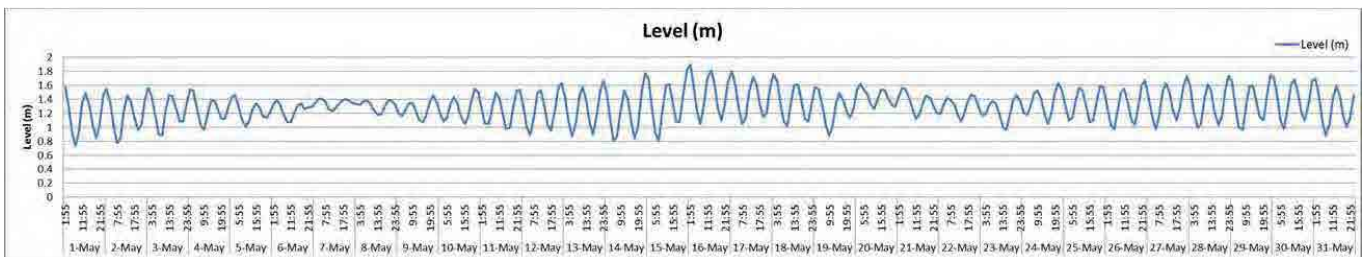
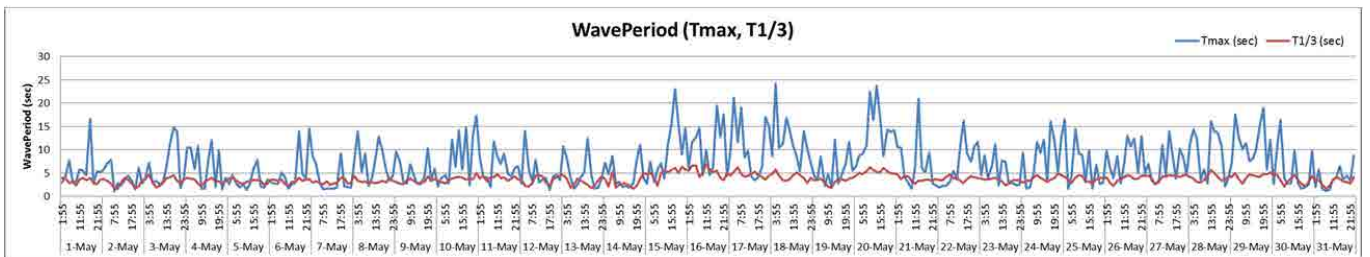
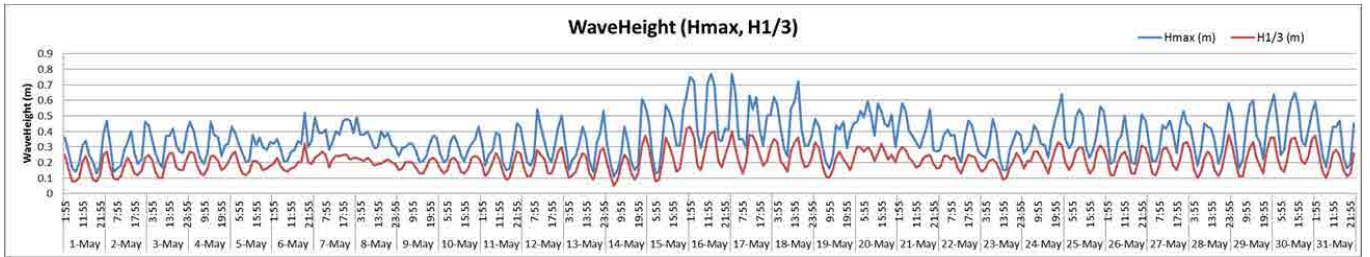
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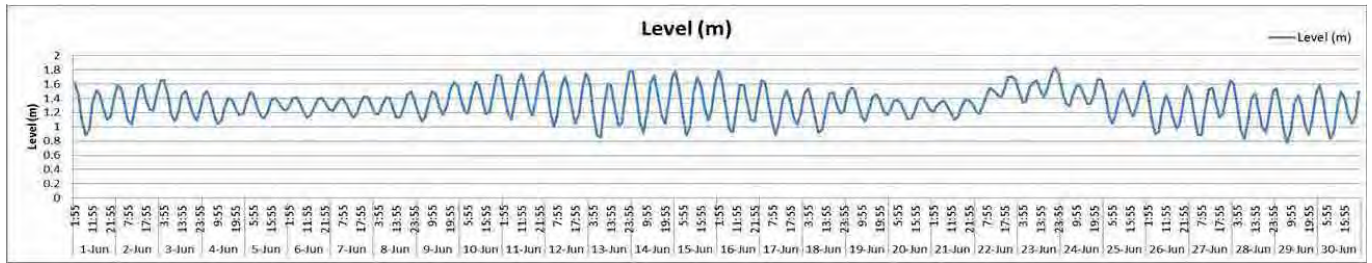
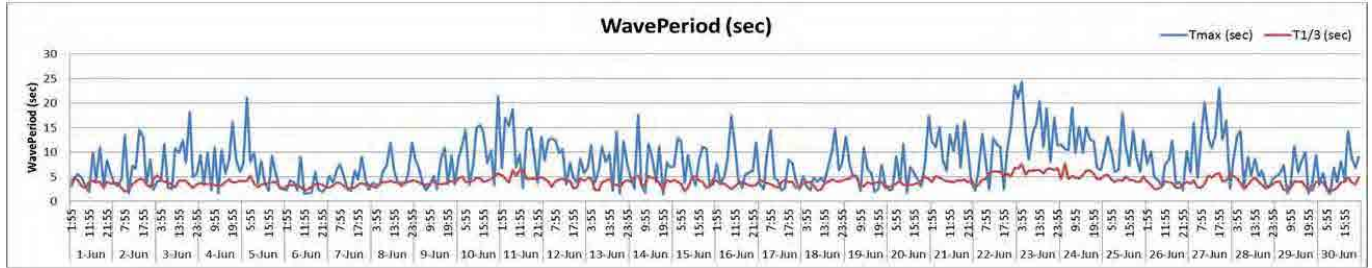
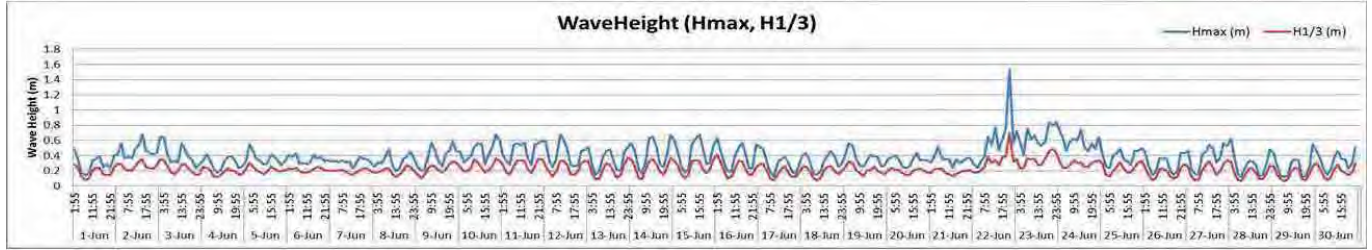
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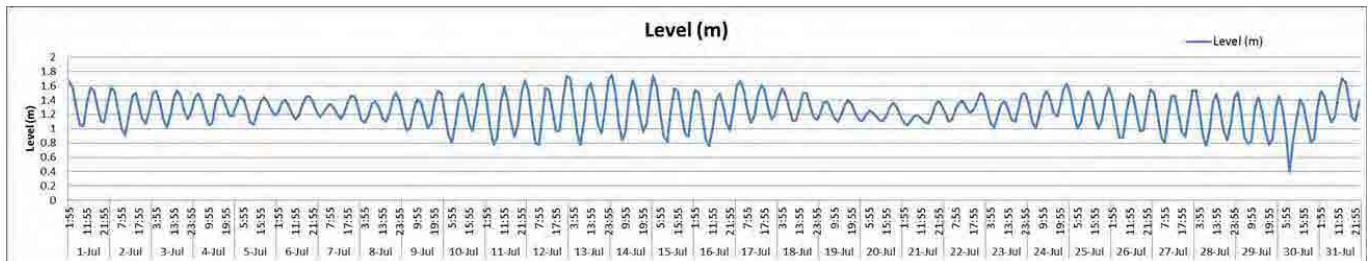
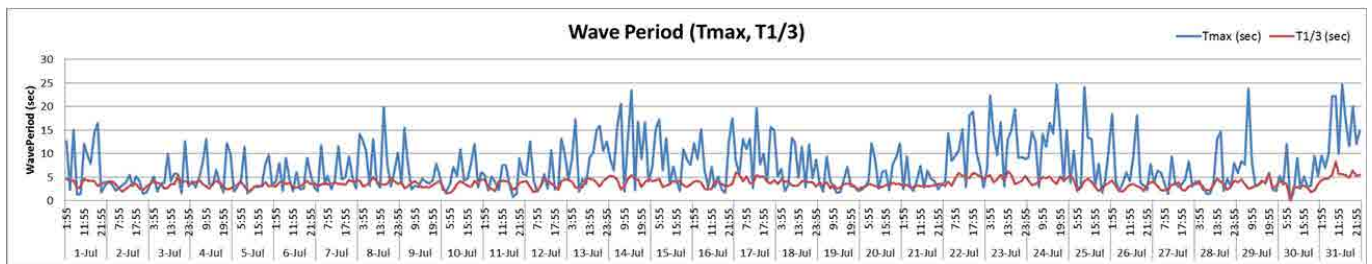
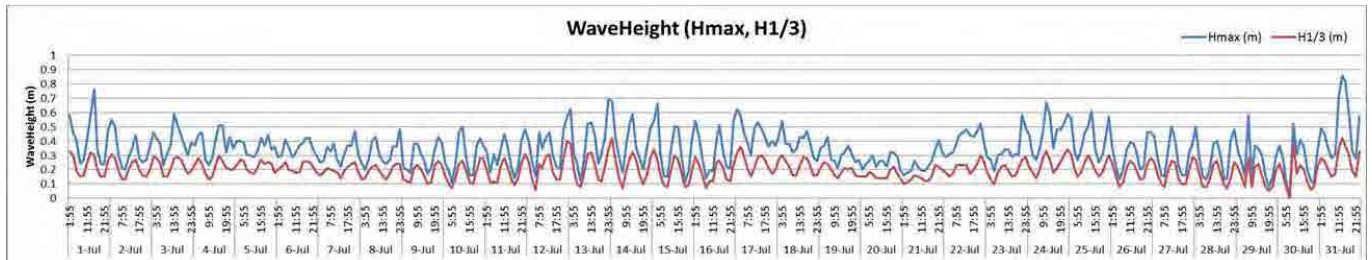
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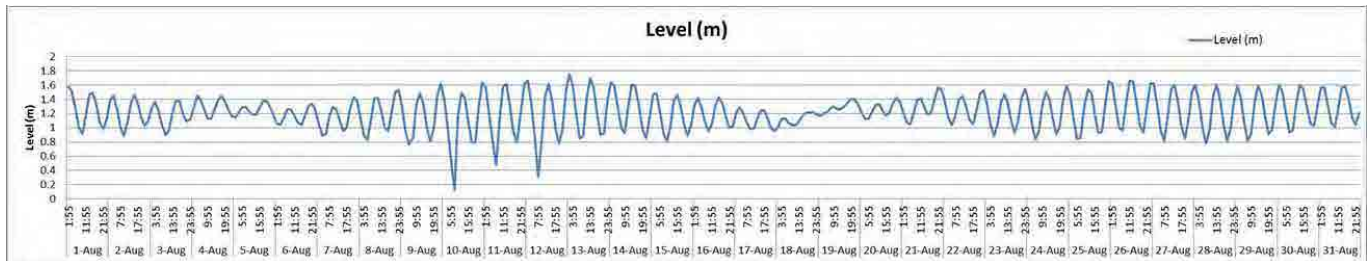
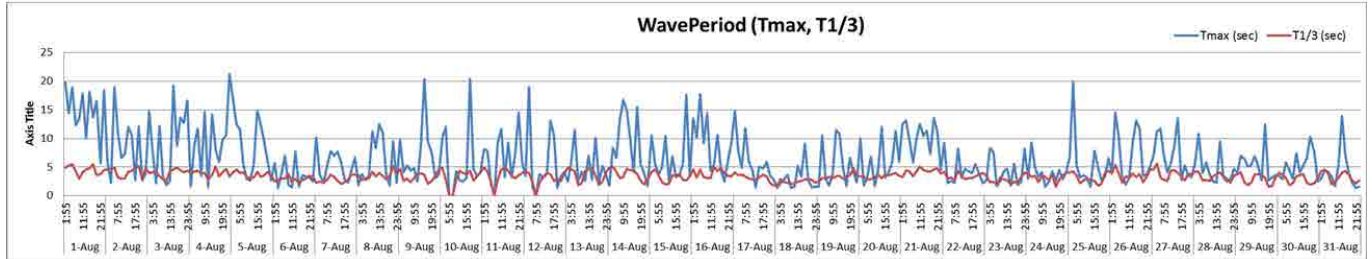
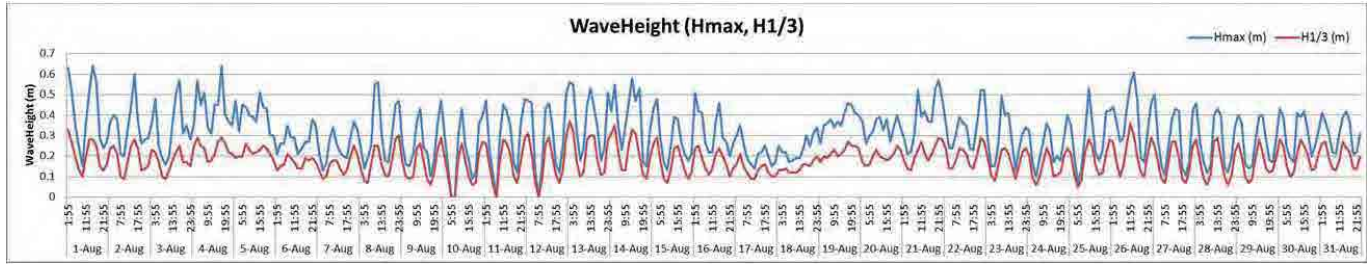
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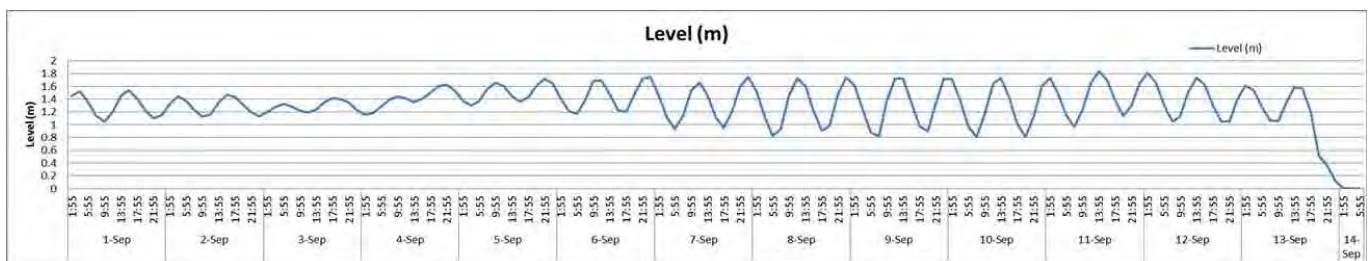
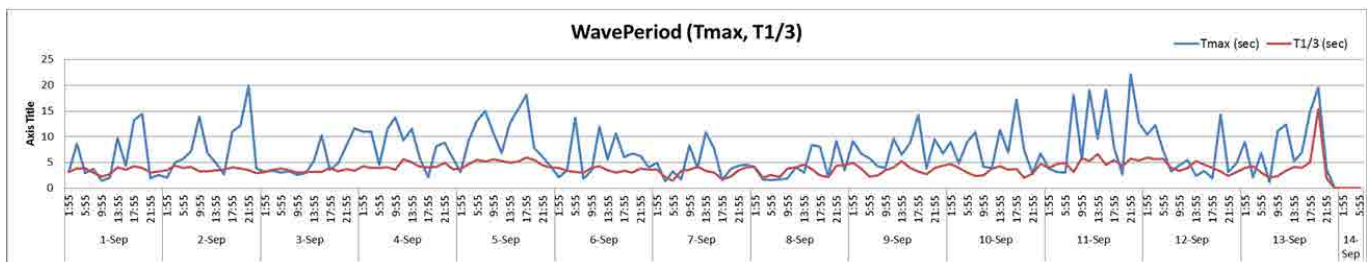
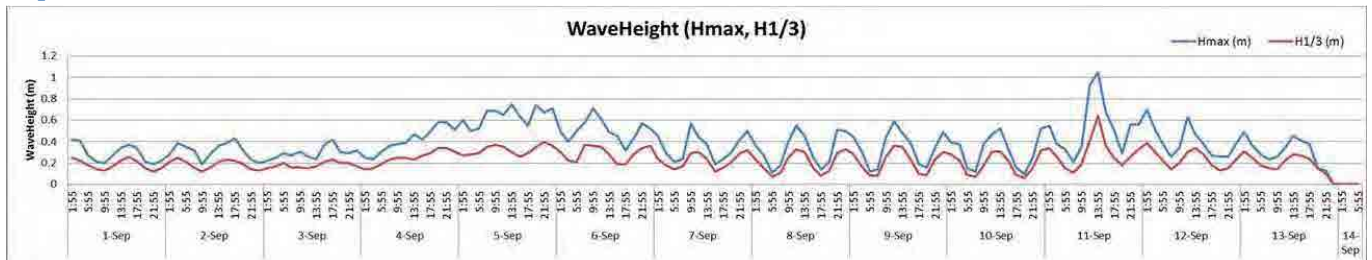
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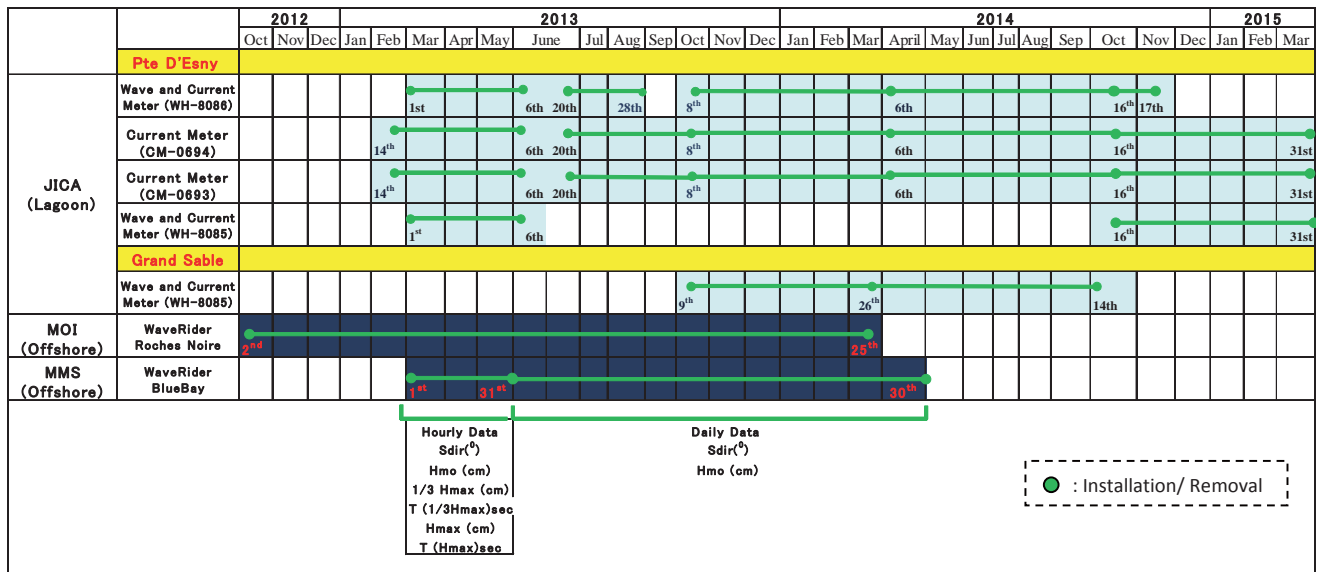
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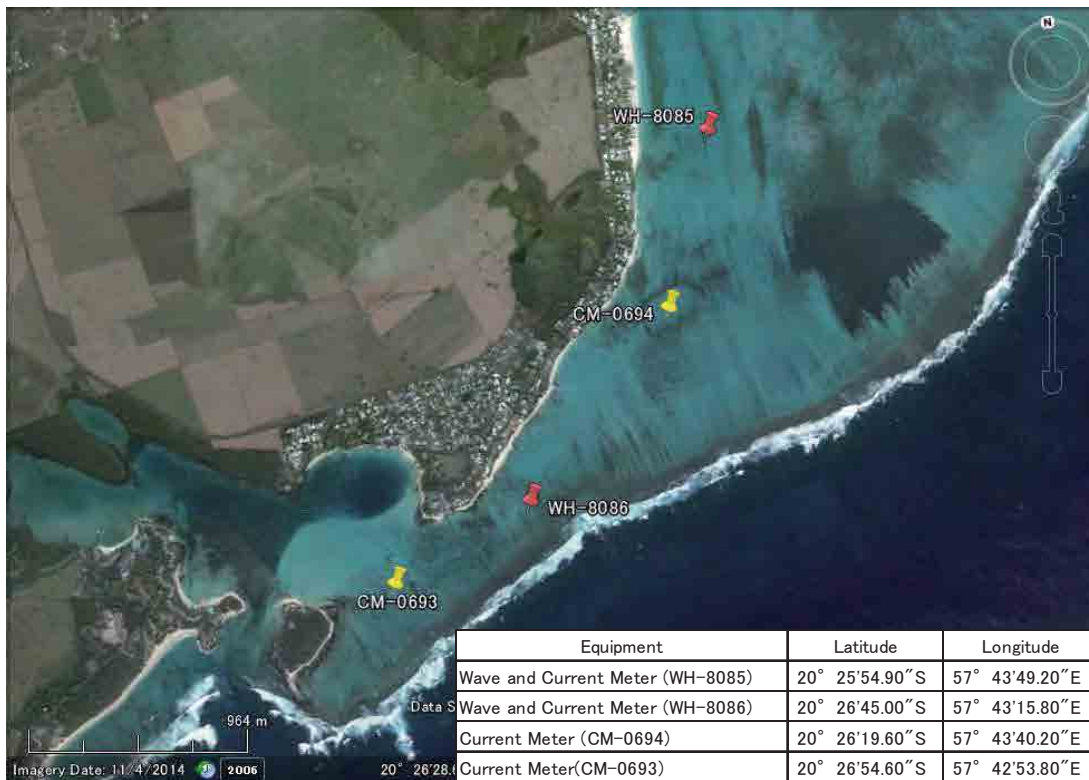
September 2014.



IICA WaveHunter(WH) and CurrentMeter(CM) Record History at Grand Sable and Pointe D'Esny.



Wave Hunter(WH) and Current Meter(CM) Location at Pointe D'Esny (Feb.2013-Oct. 2013)



Wave Hunter(WH) and Current Meter(CM) Location at Pointe D'Esny (Oct. 2013-April 2014)



Wave Hunter(WH) and Current Meter(CM) Location at Pointe D'Esny (April 2014-Mar. 2015)



Wave Hunter(WH) and Current Meter(CM) Location at Grand Sable (Oct. 2013-Oct. 2014)



10. Beach Profile Monitoring

List of dates & organisations present for BPM

SN	Sites	Beach Profile Monitoring Dates		Organisations Present
1	Grand Sable	1	2013/12/17	ICZM, JET
		2	2014/1/10	ICZM, JET, LEU, MHL
		3	2014/2/14	ICZM, JET, LEU
		4	2014/3/28	ICZM, JET, LEU
		5	2014/6/13	ICZM, JET, LEU
		6	2014/9/19	ICZM, JET, LEU
		7	2014/12/12	ICZM, JET, LEU
		8	2015/2/27	ICZM, JET, LEU
2	Ile aux Cerfs	1	2013/6/26	ICZM, JET
		2	2013/10/25	ICZM, JET
		3	2014/1/14	ICZM, LEU, JET
		4	2014/4/4	ICZM, LEU, JET
		5	2014/6/20	ICZM, LEU, JET
		6	2014/10/10	ICZM, LEU, JET
		7	2015/3/27	ICZM, LEU, JET
3	Flic-en-Flac	1	2013/10/18	ICZM, LEU, JET, MHL, BA
		2	2014/1/14	ICZM, LEU, JET, BA
		3	2014/4/11	ICZM, LEU, JET
		4	2014/6/27	ICZM, LEU, JET
		5	2014/10/3	ICZM, LEU, JET
		6	2015/2/6	ICZM, LEU, JET
4	Pointe d'Esny/Blue Bay	1	2013/12/6	ICZM, LEU, JET, BA
		2	2014/1/16	ICZM, LEU, JET, MHL, BA
		3	21-25/03/2014	ICZM, LEU, JET
		4	2014/7/11	ICZM, LEU, JET
		5	2014/10/17	ICZM, LEU, JET
		6	2015/3/20	ICZM, LEU, JET
5	Albion	1	2013/11/8	ICZM, LEU, JET, MHL, BA
		2	2014/2/7	ICZM, LEU, JET
		3	2014/4/18	ICZM, LEU, JET
		4	2014/7/18	ICZM, LEU, JET
		5	26/09/2014	ICZM, LEU, JET
		6	2015/3/6	ICZM, LEU, JET
6	Pointe aux Sables	1	2013/11/8	ICZM, LEU, JET, MHL, BA
		2	2014/1/21	ICZM, LEU, JET
		3	2014/4/25	ICZM, LEU, JET
		4	2014/7/25	ICZM, LEU, JET
		5	2014/10/31	ICZM, LEU, JET
		6	2015/4/3	ICZM, LEU, JET
7	Bras d'Eau	1	2013/11/15	ICZM, LEU
		2	2014/1/7	ICZM, LEU, JET
		3	2014/5/23	ICZM, LEU, JET
		4	2014/8/22	ICZM, LEU, JET
		5	2015/1/9	ICZM, LEU, JET
8	Mon Choisy	1	2013/12/13	ICZM, LEU, JET
		2	2014/1/30	ICZM, LEU, JET, MOI, MHL
		3	2014/5/2	ICZM, LEU
		4	2014/8/1	ICZM, LEU
		5	2014/10/28	ICZM, LEU, JET
		6	2015/1/16	ICZM, LEU
9	Trou d'Eau Douce Quatre Cocos	1	2014/11/15	ICZM, LEU
		2	2013/12/27	ICZM, LEU
		3	2014/1/7	ICZM, LEU, JET
		4	2014/5/23	ICZM, LEU, JET
		4	2014/8/22	ICZM, LEU, JET
5	2015/1/9	ICZM, LEU, JET		

10	Trou aux Biches (rock revetment)	1	2014/1/30	ICZM, LEU, JET
		2	2014/8/1	ICZM, LEU
		3	2015/1/16	ICZM, LEU
11	Grand Baie (rock revetment)	1	2013/11/29	ICZM, LEU, JET
		2	2014/5/2	ICZM, LEU
		3	2014/10/28	ICZM, LEU
12	Grand Baie ex club road	1	2014/10/28	ICZM, LEU
		2	2015/1/16	ICZM, LEU
13	Roches Noires Von Moltke	1	2014/11/15	ICZM, LEU
		2	2013/12/27	ICZM, LEU
		3	2014/1/7	ICZM, LEU, JET
		4	2014/5/23	ICZM, LEU, JET
		5	2014/8/22	ICZM, LEU, JET
		6	2015/1/9	ICZM, LEU, JET
14	Roches Noires Open Space	1	2014/11/15	ICZM, LEU
		2	2015/1/9	ICZM, LEU
15	Petit Sable	1	2014/3/14	ICZM, LEU
		2	2014/9/5	ICZM, LEU
		3	2015/2/27	ICZM, LEU
16	Bambous Virieux	1	2014/3/14	ICZM, LEU
		2	2014/9/5	ICZM, LEU
		3	2015/2/20	ICZM, LEU
17	Tamarin	1	2014/2/21	ICZM, LEU, JET
		2	2014/5/16	ICZM, LEU
		3	2014/7/4	ICZM, LEU
		4	2015/1/30	ICZM, LEU
18	La Preneuse	1	2014/2/21	ICZM, LEU, JET
		2	2014/5/16	ICZM, LEU
		3	2014/7/4	ICZM, LEU
		4	2014/8/29	ICZM, LEU
		5	2015/1/30	ICZM, LEU
19	Bois des Amourettes	1	2013/11/22	ICZM, LEU, JET, BA
		2	2013/12/30	ICZM, LEU
		3	2014/5/9	ICZM, LEU
		4	2014/9/12	ICZM, LEU
		5	2015/2/13	ICZM, LEU
20	Riviere des Creoles	1	2013/11/22	ICZM, LEU, JET, BA
		2	2013/12/30	ICZM, LEU
		3	2014/1/10	ICZM, LEU, JET, MHL
		4	2014/2/14	ICZM, LEU, JET, MHL
		5	2014/5/9	ICZM, LEU
		6	2014/9/12	ICZM, LEU
		7	2015/2/13	ICZM, LEU
21	La Prairie	1	2014/3/7	ICZM, LEU
		2	2014/8/29	ICZM, LEU
		3	2015/1/23	ICZM, LEU
22	Riviere Des Galets	1	2014/3/7	ICZM, LEU
		2	2014/5/30	ICZM, LEU
		3	2014/8/29	ICZM, LEU
		4	2015/1/23	ICZM, LEU
23	Riambel	1	2014/3/7	ICZM, LEU
		2	2014/5/30	ICZM, LEU
		3	2014/8/29	ICZM, LEU
		4	2015/1/23	ICZM, LEU
24	Le Morne	1	2014/7/4	ICZM, LEU
		2	2015/1/30	ICZM, LEU

Abbreviations

ICZM	Integrated Coastal Zone Management Div, MOESDDBM
LEU	Living Environment Unit, MOESDDBM
JET	JICA Expert Team
MHL	Ministry of Housing and Lands
BA	Beach Authority

The contents of this section are stored inside the hard disk which was handed from the JICA Expert Team to ICZM of MOESDDBM in this Project.

11. GIS Data

GIS Database

Coastal environment database

Coastal environment database consists of following three parts.

(1) ArcGIS

Various databases by using Arc GIS in terms of coast conditions.

(2) QGIS

Various databases by using QGIS in terms of coast conditions.

(3) GIS Data

Edited databases with grouping every objections based on the existing GIS data which was obtained in Mauritius.

In addition, format of (1) and (2) as mentioned above is appropriate to both GIS software but they are some data.

Moreover, data of (3) as mentioned above can be used for GIS software (1) and (2) in both.

The coordinate system and projection method are shown as following.

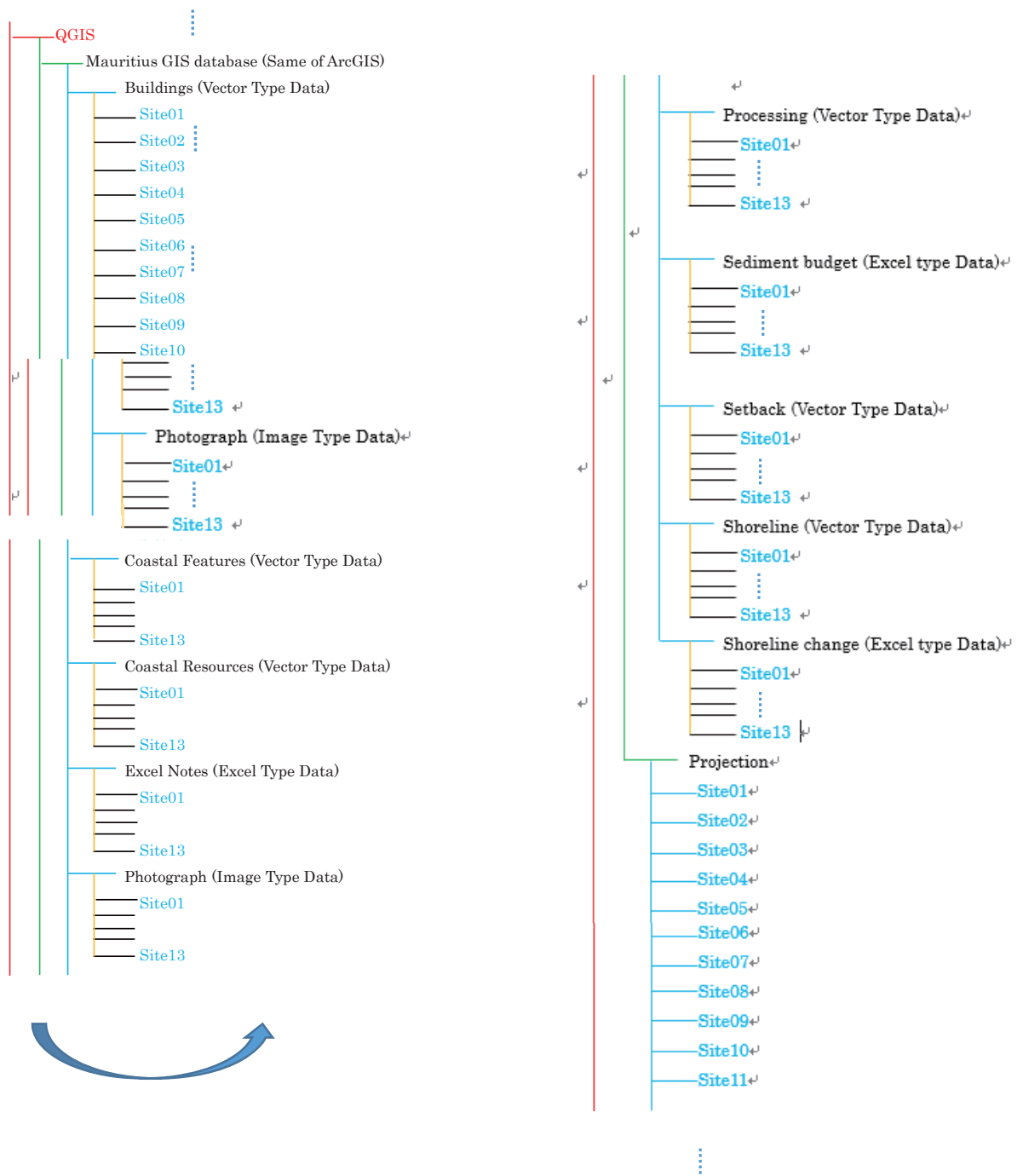
Coordinate system: S_1984_UTM_Zone_40South

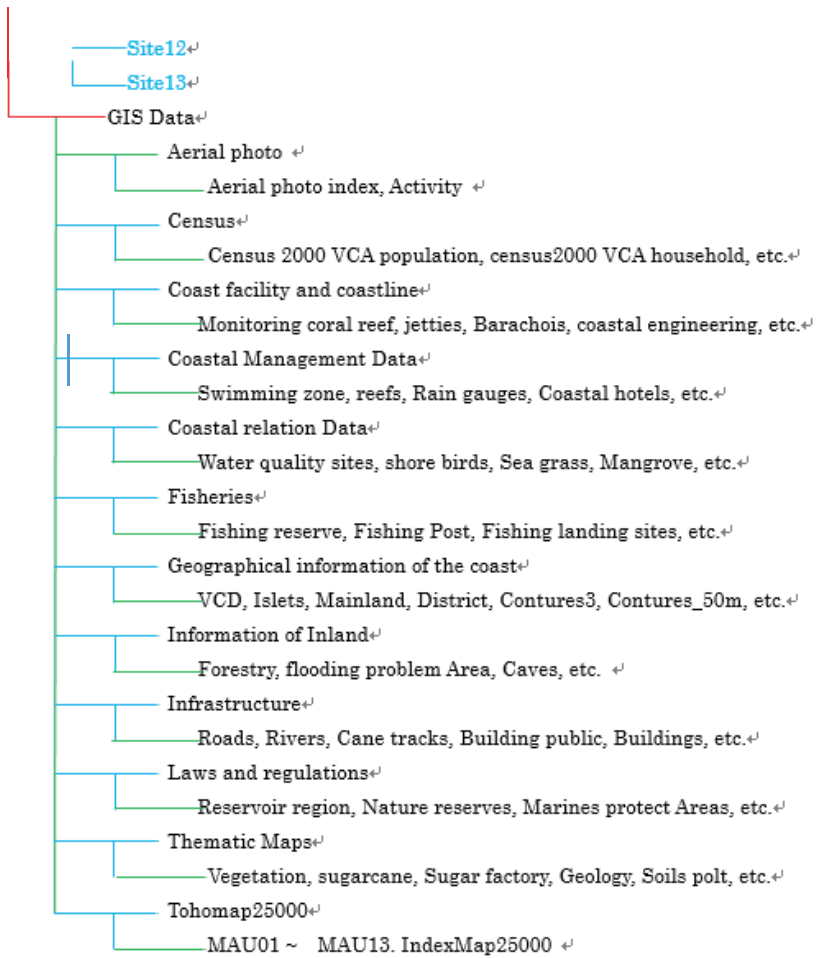
Projection method: Transverse_Mercator

(Note: Data as same as Albion will be prepared in folder of coast)

Comparison table between Site number and name of beach

Site No	SiteName	Shore Name
1	Site01	Tombeau
2	Site02	The Vale, Monchoisy, Pte Pimentos
3	Site03	Noches Noires
4	Site04	Eras d'Eaur
5	Site05	Bell Mare, Cocos, Parmar
6	Site06	Ileaux Cerf
7	Site07	Pts. d'Esny
8	Site08	St. Felix
9	Site09	Bell Ombre
10	Site10	Le Monre
11	Site11	Flic en Flac
12	Site12	Albion
13	Site13	Pts. Sable







The Project for Capacity Development on Coastal Protection and Rehabilitation and the Project for Landslide Management in the Republic of Mauritius

Attendance of Training for Image Analysis on Coastal Management using GIS held on Monday 07th July 2014 from 09h00 to 16h00 in the Conference Room, 10th & 3rd Floor, Ken Lee Tower, Barracks St, Port Louis

Chairperson: Mr R. Seenauth, Divisional Environment Officer (DEO), ICZM Division, Ministry of Environment and Sustainable Development.

Were present:

Mr A.K Dhoomun	Environment Enforcement Officer(EEO),Climate Change Division, MoESD
Mr. A. Jheengut	Environment Officer (EO), Integrated Coastal Zone Management Division, MoESD
Mrs V. Kanhye	Environment Officer (EO), Climate Change Division, MoESD
Mr L. Magho	Environment Officer (EO), Pollution Prevention Control Division, MoESD
Mrs I. Auliar	Environment Officer (EO), ICZM Division, MoESD
Ms R. Teemul	Environment Officer (EO), Policy Planning Division, MoESD
Mrs Y. Sewock- Kissensing	Environment Officer (EO), Environmental Assessment Division, MoESD
Ms J. Sannassy Pilly	Service to Mauritius Intern, Integrated Coastal Zone Management Division, MoESD
Mr. S. Curpen	Technical Design Officer, Ministry of Housing & Land
Mr S. Ramah	Technical Officer, Ministry of Fisheries
Mr. G Servansing	Technical Officer, Beach Authority
Mr. D. Bissessur	Assistant Research Scientist, Mauritius Oceanography Institute
Mr. O. Pahnin	Assistant Research Scientist, Mauritius Oceanography Institute
Mr. M. Sugita	GIS Specializing, JICA
Mr. S. Endo	Beach Management Specialising, JICA

Ms S. Mungroo	Project Assistant, JICA
Mr. N. Sumodhee	Project Assistant, JICA



The Project for Capacity Development on Coastal Protection and Rehabilitation and the Project for Landslide Management in the Republic of Mauritius

Attendance of Training for Image Analysis on Coastal Management using GIS held on Wednesday 09th July 2014 from 09h00 to 16h00 in the Conference Room, 3rd Floor, Ken Lee Tower, Barracks St, Port Louis

Chairperson: Mr R. Seenauth, Divisional Environment Officer (DEO), ICZM Division, Ministry of Environment and Sustainable Development.

Were present:

Mr A.K Dhoomun	Environment Enforcement Officer(EEO),Climate Change Division, MoESD
Mr. A. Jheengut	Environment Officer (EO), Integrated Coastal Zone Management Division, MoESD
Mr L. Magho	Environment Officer (EO), Pollution Prevention Control Division, MoESD
Ms R. Teemul	Environment Officer (EO), Policy Planning Division, MoESD
Ms J. Sannassy Pilly	Service to Mauritius Intern, Integrated Coastal Zone Management Division, MoESD
Mr. S. Curpen	Technical Design Officer, Ministry of Housing & Land
Mr S. Ramah	Technical Officer, Ministry of Fisheries
Mr. G. Servansing	Technical Officer, Beach Authority
Mr. O. Pahnin	Assistant Research Scientist, Mauritius Oceanography Institute
Mr. M. Sugita	GIS Specializing, JICA
Mr. S. Endo	Beach Management Specialising, JICA
Ms S. Mungroo	Project Assistant, JICA
Mr. N. Sumodhee	Project Assistant, JICA

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12. Aerial Photo from Helicopter

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13. Minutes of meeting for TC&SC

MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

**CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND
REHABILITATION IN THE REPUBLIC OF MAURITIUS
(JICA PROJECT)**

Notes of 1st Meeting of Technical Committee held on Tuesday 24 July 2012 at 13:30 hours in the Conference Room, 3rd Floor, Ken Lee Tower

Chairperson: **Mr. K. Heeramun, Acting Deputy Director Ministry of Environment and Sustainable Development (MOESD)**

Were present:

Name	Designation/Organisation
Mr. R Beedassy	Divisional Environment Officer, MOESD
Mrs. N Soogun	Environment Officer, MOESD
Mr. S Buskalawa	Environment Officer, MOESD
Mr. A Jheengut	Environment Officer, MOESD
Ms. H Ramdour	Environment Officer, MOESD
Mr. AK Dhoomun	Environment Enforcement Assistant, MOESD
Ms. P. Samy	Scientific Officer, MOESD (NEL)
Mr. N Khedah	Project Manager, AFB
Mr. S Zeadally	Senior Hydrological Officer, Water Resources Unit
Mr. J Mosaheb	Research Scientist, Mauritius Oceanography Institute
Mr. L. Appadu	Beach Works Inspector, Beach Authority
Mrs. M Hurbungs	Divisional Scientific Officer, Ministry of Fisheries
Mr. V. Bachraz	Deputy Director, National Parks and Conservation Service
Mr. H Caulechurn	Inspector, National Coast Guard

Japan International Cooperation Agency (JICA)

Name	Designation
Mr. H. Hashimoto	Chief Vice Advisor, JICA Expert Team (JET)
Mr. M. Sugita	GIS/Topography survey, JET
Mr. M. Sakuraba	Natural conditions/survey/analysis, JET
Mr. M. Washida	Design (1), JET
Mr. Minoru Itsui	Coastal Transformation Analysis, JET
Ms. M. Citon	Project Assistant, JET

Absent:

Mauritius Meteorological Services, Ministry of Housing and Lands, University of Mauritius, Ministry of Tourism and Leisure

Document circulated (refer to annex 1 pse)

1. Report on findings and schedule for July and August 2012 drafted by JICA Expert Team (JET)
2. Copy of presentation made by the JET during the Technical Committee

1. Opening of the meeting

- 1.1 Mr. Beedassy welcomed all members present and specifically thanked the representatives of the JICA Team for their assistance. Members were informed that Ag. Deputy Director, Mr. K. Heeramun was supposed to chair the meeting, however due to unforeseen circumstances, he could not come to the Technical Committee and presented apology on his behalf.
- 1.2 Mr. Beedassy also informed that during the first Steering Committee of this project held on 28 May 2012, it was agreed that technical Committees would be set up for the proper running of the project. In furtherance, this first Technical Committee has been set up for all the members to take stock of the progress of the project and to seek the inputs of all the members for the successful implementation of the project.
- 1.3 Mr. Beedassy and the representatives of the JICA Expert team then made a presentation of the project to the members.

2 Presentation of the Project

2.1 Mr. Beedassy provided an overview of the project on “*Capacity Development on Coastal Protection and Rehabilitation in the Republic of Mauritius*” which was being funded by the Japan International Cooperation Agency (JICA) and same was being implemented by the Ministry of Environment and Sustainable Development (MoESD).

2.2 Dr. Hashimoto of the JICA Expert Team made a presentation on the followings:

- Preliminary Findings of the project up to date
- Proposed activities for July and August 2012
- Expert of the JET visiting Mauritius
- Data requested from different stakeholders
- The proposed flow of activities for the project
- Schedule for technology transfer
- List of equipment to be used during the study.

3.0 Main issues raised

3.1 Preliminary Findings of the project

- (a) Dr Hashimoto informed that the issue of coastal erosion is not so severe as compared to other countries, however in view of future economic developments in Mauritius, some kind of proactive and innovative measures are important to harmonize coastal protection, coastal development for tourism and nature conservation.
- (b) Mr. Beedassy informed the Committee of the different projects [Coastal Protection works under PBB, African Fund Board (AFB) Climate Change Adaptation Programme in the Coastal Zone of Mauritius, African Adaptation Programme (AAP)] being implemented at the level of this Ministry and in this line iterated the need for synergy of these projects with the study being undertaken by the JICA Team.
- (c) Further to the presentation by Dr Hashimoto on findings of Dr Nojima on coral reef survey around Mauritius (between 3.6.12 to 28.6.12), Mrs Hurbungs of Ministry of Fisheries and also Mr Mosaheb of Mauritius Oceanography Institute (MOI)

requested for a copy of the findings. Mr. Beedassy informed that this is a preliminary finding and no inference is expected at this point in time.

3.2 Capacity Building and Technology Transfer

- (a) In line with the capacity building and technology transfer part of the project, Dr Hashimoto informed that several training programs are being finalized and same would be communicated at a later stage.
- (b) Mr. Beedassy requested the stakeholders, to identify Officers at their level to form part of any eventual training programs and additionally during the technical surveys being undertaken by the JET around Mauritius.

3.3 Request for data

- (a) Dr Hashimoto expressed his appreciation to all stakeholders on the provision of data and requested their full support and collaboration to the project.
- (b) Mrs. Soogun informed that she had a meeting together with the JICA team at the Meteorological Services and also the Ministry of Housing and Lands and necessary procedures are being initiated for acquisition of data.
- (c) Mrs. Hurbungs of Ministry of Fisheries reiterated the availability of long term data on lagoon water quality and coral reef monitoring.
- (d) Further to query from Mr Beedassy on the possibility to use laboratory facilities, Mrs. Hurbungs informed that laboratory facilities could also be made available upon request.
- (e) Ms. P. Samy of the National Environment Laboratory also informed on the availability of data on water quality at their level. Additionally laboratory facilities could be made available as and when required.
- (f) In line with the importance of bathymetry data for the project, Mr Mosaheb of Mauritius Oceanography Institute (MOI) informed about the availability of bathymetric data for the Flic en Flac and Mon Choisy lagoon area and same could be made available upon request.

3.4 List of Equipment

- (a) Dr Hashimoto apprised the members of the equipment that have been bought under the project and at the end of the project same would be handed to the Government of Mauritius.
- (b) Mr Beedassy reiterated the need for active participation of the stakeholders during the use of the equipment for capacity building as at the end of the project the equipment would be handed to the relevant stakeholders for use.
- (c) In relation to wave height meter which would be bought under the JICA Project, Mr. Mosaheb of MOI informed that his Institution has placed a wave height meter in the North (at Roches Noire) and real time data are sent to the Meteorological Services.
- (d) Members were informed that the wave height meter would be used at demonstration sites yet to be identified under the JICA project for approximately two years and at the end of the project same would be handed over to the relevant authority.

3.5 A.O.B

- (a) Mr Bachraz of National Parks and Conservation Service, queried on the role of the NPCCS under the project. In this line Dr Hashimoto informed that their role would be important during formulation of coastal conservation plans especially for those coastal areas that are near to forest areas.
- (b) Mr. Bacharaz also requested on the possibility to include certain islets with particular attention to Ilot Gabriel as a study site under the JICA project as Ilot Gabriel is facing erosion problem.
- (c) Mr. Beedassy informed that certain islets namely Ile aux Cerfs and Ilot Mangenie has already been included for study under the project.
- (d) Further to query from National Coast Guard on its role, Mr Beedassy requested on the possibility to send a message to Officer in Charge of the different National Coast Guard posts around the island informing them about the project and also on their assistance during survey to be undertaken by the JICA team if need be.
- (e) Mr. Buskalawa queried about the sites that have been identified under the JICA project for sediment budget analysis. In this line Mr Beedassy informed that sediment budget analysis would be carried out in 13 cells and in relation to the sites identified

under the AFB project, Mon Choisy and Riviere des Galets sites form part of these cells. However, Quatre Soeurs site does not form part of the cells as it is a muddy beach. The JICA team is working on sandy beaches only.

- (f) Mr. Buskalawa requested that any data generated from the JICA project, relevant to the Mon Choisy and Riviere des Galets sites be made available to the CPI Division and AFB Project Manager, in due course.

- (g) Mr. Beedassy also requested the representative of the Beach Authority to actively participate together with JICA team during their survey along the public beaches of Mauritius.

3.6 Following discussions, it was agreed that:

- Letter to be sent to Mauritius Oceanography Institute requesting for any water quality data and bathymetric data available.
- Letter to be sent to Ministry of Fisheries requesting for water quality data, coral reef monitoring data and the possibility for use of laboratory facilities.
- Letter to be sent to all relevant stakeholders to identify an officer who would form part of the JICA project for capacity building.

4.0 The Chairman thanked the members present. The meeting ended at 15 00 hrs.

3 August 2012

MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND REHABILITATION IN THE REPUBLIC OF MAURITIUS

(JICA PROJECT)

Notes of 2nd Meeting of Technical Committee held on Friday 17th August 2012 at 13 00 hours in the Conference Room, 3rd Floor, Ken Lee Tower

Chairperson: Mr. K. Heeramun, Acting Deputy Director Ministry of Environment and Sustainable Development (MOESD)

Were present:

Name	Designation/Organisation
Mr. R Beedassy	Divisional Environment Officer, MOESD
Mr D Prithipaul	Divisional Environment Officer, MOESD
Mrs D Boodhun	Divisional Environment Officer, MOESD
Mr D S Chamilall	Environment Officer, MOESD
Mrs. N Soogun	Environment Officer, MOESD
Mrs Bhaguirutty	Environment Officer, MOESD
Mr. A Jheengut	Environment Officer, MOESD
Ms. H Ramdour	Environment Officer, MOESD
Mrs R Mookool	Environment Officer, MOESD
Mrs Y Poinen	Environment Officer, MOESD
Mr. AK Dhoomun	Environment Enforcement Assistant, MOESD
Mr N Sunathee	Trainee , MOESD
Mr N Nawjee	Forest Ranger , Forestry Service
Mr J Jokhoo	Senior Enforcement Officer , Ministry of Local Government

Name	Designation/Organisation
Dr D Bissessur	ARS Mauritius Oceanography Institute
Mr Y Gungah	Technical Officer , Beach Authority
Mrs M Hurbungs	Divisional Scientific Officer , Ministry of Fisheries
Mr S Pandoo	Senior Technical Officer , National Parks and Conservation Service
Mr H Cauleechurn	Inspector of Police National Coast Guard
Dr R Ramessur	Associate Professor , University of Mauritius
Mrs C Pothunah- Aubeeluck	Tourism Planner, Ministry of Tourism

Japan International Cooperation Agency (JICA)

Name	Designation
Dr T. Uda	Visiting Professor
Mr S. Onaka	Counter measure to coastal erosion/monitoring
Mr. M. Sakuraba	Natural conditions/survey/analysis, JET
Mr. M. Washida	Design (1), JET
Mr. Minoru Itsui	Coastal Transformation Analysis, JET
Mr T Kurata	Water quality management/environmental and social consideration
Ms. S Bundhun	Project Assistant, JET

Absent:

Mauritius Meteorological Services

Ministry of Housing and Lands

Document circulated (refer to annex pse)

1. Copy of presentations made by the JET during the Technical Committee

1. Opening of the meeting

Mr Heeramun welcomed all members present. The notes of meeting held on the 27th July 2012 was read and approved with the following amendments

Pg 3 to delete 'coral reef monitoring '

2. Matters arising:

- a) Mr Beedassy informed that letters were being issued to MOI and Ministry of Fisheries in connection with availability of data.
 - b) Mrs Hurbungs informed that Mr Ramcharun DSO has been nominated as contact person for the project to represent the Ministry of Fisheries. He was responsible for the laboratory and would provide all necessary information.
3. Mr Heeramun then invited Dr Uda to make his presentation.
4. Dr Uda made a first presentation on the situation at Pte D'Esny. Copy of presentation is at Annex1.
- (a) He found that two long groins have blocked the sand and were causing erosion of the beach downdrift. He said that having a comprehensive understanding of the full scale coastline was very important.
 - (b) The actual phenomena for beach evolution must be understood (when did the erosion start, where erosion happened, how did it happen, to what extent amongst others). The cause of erosion should be understood.
5. Dr Uda then made a second presentation on a case study in Japan making use of gravel on the beach. Copy of presentation is at Annex 2. He proposed that coarse material , such as gravel, may be considered for beach reprofiling in Mauritius. He said that coarser material remain longer on the beach subject to erosive forces. Gravel can be obtained easily and can be less costly than boulders.
6. To a query from the representative from MOI concerning
- (i) the use of gravel on the beaches of Mauritius , where there is presence of lagoons and
 - (ii) the issue of dynamicity is very different from the beaches in Japan
- Dr Uda responded that general circulation is a very important point. Conservation of beach and living animals are also very important. Care must be taken while designing for structures in the lagoon as wave height is not so high. The use of gravel would provide for better stability than the use of sand.
7. Mr Onaka then made a presentation on progress and preliminary study results. Copy of presentation is at Annex 3. He informed that

- (i) They were still on basic survey stage which is expected to be completed by the end of the year.
- (ii) Mr Sakuraba collected information on oceanography data and climate data. He started the preliminary analysis for storm surges .
- (iii) Mr Sugita collected data on aerial imagery and has started shoreline change analysis
- (iv) Mr Itsui has collected data on coral sand mining and has started on beach change analysis
- (v) Mr Washida is working on design parameters for coastal protection.

8. Following discussions the following points were raised

- (i) **Recession of cliffs:** It was noted that cliff recession has not been dealt with in previous studies and there was a gap in the existing laws and guidelines. It was proposed that changes on cliffs be also considered in the project. The use of aerial photos may be made for same. It was proposed to classify the coastline of Mauritius as cliff, sandy beach with coral reef and without coral reef. Then conservation of sandy beaches can be looked into.
- (ii) **Coastal sites vulnerable to climate change:** It was proposed that joint site visits be effected in presence of Dr Hashimoto in October 2012. Criteria such as presence of houses may be used to classify the sites.
- (iii) **Water quality monitoring:** Dr Uda said that if data from the Ministry of Fisheries would be sufficient then there would be no need to carry out further tests and water quality surveys. It was suggested that a meeting be held with the Fisheries Laboratory officers and JICA team to sort out the matter. It was also suggested to include WMA in the meeting. Dr Uda also suggested that Dr Kurata shall come up with a proposal on how to improve water quality at some sites by giving some concrete measures/actions that need to be taken.
- (iv) **Beach profile monitoring:** Out of the 13 sites selected for shoreline changes, some 2-3 sites would be chosen for beach profile monitoring under the Project. The representative from MOI informed that MOI is also carrying out shore profile monitoring every six months.
- (v) **Demonstration projects:** sites for demonstration projects need to be proposed and finalised. It was proposed that this decision be taken after the study of the shoreline changes at the 13 sites be completed as same would come up with a list of affected beaches requiring remedial actions

on a priority basis. Based on this list , then the demonstration sites may be chosen .

9. Mr Heeramun thanked Dr Uda, Mr Onaka and the members for their contribution. The meeting ended at 15 hrs.



MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

Notes of Meeting of the Third Technical Committee held on Thursday 27 September 2013 at 10 00 hrs in connection with coral reef survey undertaken in June 2012 by Dr S. Nojima under the JICA Project "for Capacity Building in Coastal protection and Rehabilitation in the Republic of Mauritius", in the Conference Room, 3rd Floor, Ken Lee Tower, Barracks St, Port Louis.

Were present

Mr P. Kallee	Ministry of Environment and Sustainable Development (Chairman)
Mr. J. Seewoobaduth	Ministry of Environment and Sustainable Development
Mr R. Beedassy	Ministry of Environment and Sustainable Development
Mr. A. Dosieah	Ministry of Environment and Sustainable Development
Mr D. Chamilall	Ministry of Environment and Sustainable Development
Mr. S. Buskalawa	Ministry of Environment and Sustainable Development
Mr L. Magho	Ministry of Environment and Sustainable Development
Mr A. Jheengut	Ministry of Environment and Sustainable Development (Secretary)
Ms H. Ramdour	Ministry of Environment and Sustainable Development
Mr A. Dhoomun	Ministry of Environment and Sustainable Development
Mr N. Khedah	Adaptation Fund Board
Mr N. Nawjee	Forestry Services
Mr. C. Puchooa	Road Development Authority
Mr S. Zeadally	Water Resources Unit
Mr Y. Gunga	Beach Authority
Mrs P. Aubeeluck	Ministry of Tourism and Leisure
Dr R. Ramessur	University of Mauritius
Mr. S. Pandoo	National Parks and Conservation Service
Mr A. Rawat	Mauritius Oceanography Institute
Mr H Cauleechurn	National Coast Guard
Mr K. Ichikawa	Japanese Expert Team
Dr S. Nojima	Japanese Expert Team
Mrs K. Saito	Japanese Expert Team

Absent

Ministry of Fisheries

1. Opening of meeting

- 1.1 The Chairman welcomed all members present and specifically thanked the representatives of the Japanese Expert Team (JET) for their assistance. Members were informed that the purpose of this meeting was to provide an overview of the results of the coral reef survey carried out by Dr S. Nojima in June 2012.

1.2 Dr S. Nojima, from the JET was then invited to make a presentation on the results of the coral reef survey.

2. Presentation on the coral reef survey results

2.1 Dr S. Nojima from JET made a presentation of the followings:

- (i) Purpose for coral reef monitoring survey
- (ii) Anatomy and physiology of corals
- (iii) Explanation on fore reefs, back reefs and shore reefs
- (iv) Monitoring sites carried out in June 2012
- (v) Methodology (spot-check method)
- (vi) Preliminary results
- (vii) Possible causes of degradation
- (viii) Example of conservation plan in Japan.

2.2 The salient features noted were:

- (i) In June 2012, monitoring surveys were undertaken at 19 sites (namely Bain Boeuf, Cap Malheureux, Butte a l'herbe, Poudre d'Or, Trou d'Eau Douce (3 sites) , GRSE, Baie du Cap, Le Morne, Blue Bay (2 sites), Saint Felix, Bel Ombre, La Preneuse, Albion, Flic en Flac and Ile aux Benitiers.
- (ii) Average coral coverage for the above mentioned sites were 22.2 %
- (iii) The average living corals was greater than 50% at three sites [Cap Malheureux, Butte a l'Herbe and Trou d'Eau Douce (shore reef)].
- (iv) Most of the sites were dominated by branching Acropora species.
- (v) Percentage of juvenile corals were almost nil and at several sites (Poudre d'Or, Butte a l'herbe and Cap Malheureux) the transparency was less than 2 metres (m).
- (vi) Based on results from Albion Fisheries Research Centre (AFRC) it could be concluded that the percentage coral coverage at these sites has decrease from 51.4% in 2000 to approx 22.2 % in 2012.
- (vii) The main possible causes for coral coverage decrease could be attributed to coral bleaching events (2003, 2004, 2005), algal bloom events (2009 and 2010), siltation and eutrophication

3. Main Issues raised

3.1 Dr S. Nojima apprised that the above mentioned results were preliminary and major conclusions were not expected at this stage. He added that additional survey would be carried out during the JICA Project and the next survey was scheduled for October 2012.

3.2 The Chairman iterated that there was a need for further surveys to be able to come up with conclusive results. However this initial survey has provided an

early depiction of the situation and accordingly there would be a need to initiate remedial measures.

- 3.3 The Chairman also added that the above results showed that the recruitment of juvenile corals was almost nil at most of the sites surveyed and it may be inferred that our coral are ageing and this situation may be exacerbated with the effect of climate change.
- 3.4 The representative of University of Mauritius expressed the followings :
- Siltation in the lagoon was an important issue to be addressed. He captured the example of Balaclava Marine Park, where heavy siltation could be noted.
 - There was also a need for investigation on submarine freshwater seepage that could bring high amount of nutrients in the lagoon causing eutrophication.
- 3.5 The Chairman iterated that fresh water seepage (with high nutrient load) in the lagoon was really an important issue that needed further investigation and cited the example of eutrophication in the region of Palmar, where necessary measures were required.
- 3.6 Dr S. Nojima also apprised that there are several techniques available for coral transplantation in Japan and same could be transferred to Mauritius. Under the Project he would come up with Coral Conservation Plans, however the success of these techniques/plans would depend on how the issues such as siltation, eutrophication amongst others would be addressed.
- 3.7 The Chairman added that there was a need to come up with innovative remedial measures that would take into account the effect of climate change or else we might lose all our remaining corals in the future.
- 3.8 The Chairman reiterated that the commitment of the key stakeholders was imperative for the successful implementation of any remedial measures.

The Chairman thanked all the members for their presence and support. The meeting ended at 11 30 hrs

September 2012

MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT**CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND REHABILITATION IN THE
REPUBLIC OF MAURITIUS (JICA PROJECT)**

Notes of the 4th Meeting of Technical Committee held on Friday 7th December 2012 at 10 00 hours in the Conference Room, 3rd Floor, Ken Lee Tower

Chairperson: Mr. K. Heeramun, Acting Deputy Director Ministry of Environment and Sustainable Development (MOESD)

Were present:

Name	Designation	Organisation
Mrs S Meeheelaul	Divisional Environment Officer	Ministry of Environment and SD
Mrs D Rajkumar	Divisional Environment Officer	Ministry of Environment and SD
Mr L Magho	Ag Divisional Environment Officer	Ministry of Environment and SD
Ms P Samy	Scientific Officer	Ministry of Environment and SD
Mrs T Abdool	Environment Officer	Ministry of Environment and SD
Mr R Ohseng	Environment Officer	Ministry of Environment and SD
Mr V Ponin	Environment Enforcement Officer	Ministry of Environment and SD
Ms H B Naujeer	Research and Development Officer	National Parks and Conservation Service
Mrs C P Aubeeluck	Tourism Planner	Ministry of Tourism and Leisure
Mrs K Bhogun	Tourism Planner	Ministry of Tourism and Leisure
Dr Dass Bissessur	Assistant Research Scientist	Mauritius Oceanography Institute
Mr J Mosaheb	Ag Project Research Officer	Mauritius Oceanography Institute
Mr G Servansingh	Technical Officer	Beach Authority
Ms P Gujadhur	Hydrological Officer	Water Resources Unit
Mr H Caillechurn	Inspector of Police	National Coast Guard
Mr N Nawjee	Forest Ranger	Forestry Services
Ms R Kawanishi		JICA Expert Team
Ms S Bundun		JICA Expert Team
Ms N Marie		JICA Expert Team
Mr H Hashimoto	Vice Chief Advisor	JICA Expert Team
Mr S Endo	Coastal Space Management	JICA Expert Team
Mr H Takakaze	Economic/Financial	JICA Expert Team
Mr M Sugita	GIS	JICA Expert Team
Ms K Saito	Organizational Analysis	JICA Expert Team
Mrs N Soogun	Environment Officer	Ministry of Environment and SD

	(Secretary)
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1. Opening

Mr Heeramun welcomed all members present and informed that this Technical Committee has been convened to follow up on the activities being carried under the project 'Capacity Building on coastal protection and rehabilitation in the republic of Mauritius by JICA expert team. He then invited Dr Hashimoto to make the presentations as per the agenda items.

2.0 Matters arising

2.1 Shoreline change using aerial photos

- a) Dr Hashimoto made a presentation (copy at annex1) on the findings of the analysis of coastal erosion by making use of existing aerial photos from 1967 to date. He informed that
- (i) The shoreline around Mauritius was rather stable or accreting and only around 11% was eroding.
 - (ii) Concerning river mouths that are clogged by sand due to effect of waves and current from river, these situations arise from natural processes. It was important to keep these sites as natural as possible and not to interfere with the dynamic natural processes.
 - (iii) The JICA Expert Team was in process of preparing the progress Report which would be presented at the Steering Committee scheduled for January 2012. Then detailed information would be presented on the findings.
- b) To a query from the representative from MOI on the accuracy of the study using aerial imagery and human activity impacts , Dr Hashimoto responded that the aerial images did not specify time of photo and tide level, and taking into consideration that the change in tidal level in Mauritius is quite small (50 cm) , the margin of errors also becomes quite small. Aerial Photos can be used to estimate the movement of sediments and the extent of erosion /accretion. The human impacts on sediment movement were quite difficult to estimate using aerial photos as there was lack of data. To consider human impacts on sediment movement we need to carry out proper benchmarking and detailed beach profiling at each site.

2.2 Surveys on disasters in the coastal zone

- a) Dr Hashimoto informed that the JICA Expert Team would carry out surveys on damages caused by cyclones through interviews of the local population . Some 10 eroded sites have been identified and at each sites some 30 interviews would be carried out .

- b) In order to build capacity of the members in carrying out such surveys, it was proposed that a working group be set up with members of the Technical Committee to carry out the survey guided by the JICA expert Team. JICA would prepare a questionnaire by the end of December 2012. The Working Group would then finalise the questionnaire. The first meeting of the working group would be in January 2013.

2.3 Water Quality Survey

- a) Dr Hashimoto informed that surveys carried out in the lagoons tend to indicate that coral reefs were in a degraded state. In order to confirm whether eutrophication of the lagoons was contributing to this degradation, water quality surveys were being carried in presence of MOESD (NEL) and the Ministry of Fisheries. Water quality monitoring would be carried on two occasions, namely during the dry and wet season.
- b) The next monitoring would be around May 2013.

2.4 Institutional setup

- a) Ms K Saito made a presentation on the institutional setup, enforcement and management responsibilities. She circulated a questionnaire to members on the institutional setup and invited them to make their contribution.
- b) After discussions it was proposed that a working session be held on Friday 14 December 2012 at 14 00 hrs to discuss on the questionnaire and provide inputs.

2.5 Equipment under the project

- a) Dr Hashimoto informed that the waves come normally from three directions; one from the north, one from the south east and one from the south west. Actually the Meteorological Services has one wave gauge at Blue Bay and MOI has installed one at Roche Noire. Wave heights may be estimated from the strength of cyclones, however actual data is very important.
- b) In that respect JICA would be bringing two wave gauge meters in Mauritius in January 2013 to measure wave heights and currents in the lagoon. After the project these wave gauges would be handed over to the Government of Mauritius.
- c) It was proposed that a meeting be held with MMS and MOI to discuss on the locations where these wave gauges would be placed, possible handover and maintenance of the equipment.

3. The Chairperson thanked all members present and the meeting ended at 11 40 hrs.

MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

Notes of Meeting of the fifth Technical Committee held on Tuesday 29 January 2013 at 10 00 hrs in connection with Draft Preliminary Progress Report under the JICA Project “Capacity Building in Coastal Protection and Rehabilitation in the Republic of Mauritius”, in the Conference Room, 10th Floor, Ken Lee Tower, Barracks St, Port Louis.

Were present

Mrs. D. Lan Ng	Director, Ministry of Environment and Sustainable Development (Chairperson)
Mr. K. Heeramun	Divisional Environment Officer, Ministry of Environment and SD
Mr. J. Seewoobaduth	Divisional Environment Officer, Ministry of Environment and SD
Mrs. S. Meecheelaul	Divisional Environment Officer, Ministry of Environment and SD
Mr. D. Prithipaul	Divisional Environment Officer, Ministry of Environment and SD
Mr. R. Beedassy	Divisional Environment Officer, Ministry of Environment and SD
Mr. R. Seenauth	Divisional Environment Officer, Ministry of Environment and SD
Mr. M. Jeelall	Project Manager, Living Environment Unit
Mr. B.M.D Kurreemun	Assistant Secretary, Ministry of Environment and SD
Mrs. N. Soogun	Environment Officer, Ministry of Environment and SD
Mr. S. Buskalawa	Environment Officer, Ministry of Environment and SD
Mr. A. Jheengut	Environment Officer, Ministry of Environment and SD
Miss H. Ramdour	Environment Officer, Ministry of Environment and SD
Miss Y. Poinen	Environment Officer, Ministry of Environment and SD
Mr. Y. Fanny	Scientific Officer, Ministry of Environment and SD
Mr. H. Cauleechurn	Inspector of Police, National Coast Guard
Mr. P. Jhuboo	Principal Engineer, Ministry of Public Infrastructure, NDU, LT& S
Mr. J. Mosaheb	Ag. Principal Research Scientist, Mauritius Oceanography Institute
Dr R. Ramessur	Associate Professor, University of Mauritius
Mr. H. B Naujeer	Research Development Officer, National Parks and Conservation Service
Mr. N. Nawjee	Forest Ranger, Forestry Service

Mrs. Y. B. Moonshiram	Lecturer, University of Mauritius
Mrs. C. P. Aubeeluck	Tourism Planner, Ministry of Tourism and Leisure
Mr. G. Servansing	Technical Officer, Beach Authority
Mr. R. Soborun	Senior Planner, Ministry of Housing and Lands
Mr. M. Marie	Principal Enforcement Officer, Ministry of Local Government and Outer Islands

JICA TEAM

Mr. S. Onaka
Mr. K. Ichikawa
Mr. K. Takahashi
Mr. M. Itsui
Miss H. Yoshida
Miss R. Kawanishi
Mr. M. Sakuraba
Miss K. Saito
Miss M. Citon

Were absent

Representative of Ministry of Fisheries
Representative of Mauritius Meteorological Services
Representative of Water Resources Unit

1. Opening of meeting

1.1 The Chairman welcomed all members present and specifically thanked the representatives of the Japanese Expert Team (JET) for their assistance. Members were informed that the purpose of this meeting was to provide an overview of the findings of draft progress report by the JET for the period June 2012 up to date.

1.2 Mr S. Onaka, from the JET was then invited to make a presentation on the findings of the draft progress report.

2. Presentation on progress report

2.1 Mr S. Onaka from JET made a presentation of the followings:

- (i) Outline of the Progress for Component-1 (Basic Study)
- (ii) Results of Data Analysis
- (iii) Selection of Study Area
- (iv) Formulation of Coastal Conservation Plan and Spatial Management Plan
- (v) Schedule and Action

2.2 The salient features noted were:

- (i) The main activities under component 1 (to be completed by end of February) of the project were as follows :
 - Data collection and analysis
 - Procurement and shipping of instruments and materials for site investigation
 - Topographic interpretation, water quality survey, bottom material survey, coral reef survey, GPS survey, taking aerial photos and interview survey.
 - Data analysis
 - Identification of existing condition and risks
 - Specifying the areas affected by coastal erosion and the areas of coral reef-decline
 - Database construction for coastal environment.
- (ii) The JET has partly embarked on Component 2 of the project and focussed mainly on the elaboration of coastal conservation strategy.
- (iii) Twenty (20) coasts have been selected for basic study which includes 13 sand sediment cell coast (Baie du Tombeau, Pointe aux Piments/Trou aux Biches/Mon Choisy, Roches Noires, Bras d'Eau, Ile aux Cerfs, Pointe d'esny, Riambel/Saint Felix/Riviere des Galets, Bel Ombre, Le Morne, la Preneuse/Tamarin/Flic en Flac, Albion and Pointe aux Sables), 1 cliff coast (Albion cliff near lighthouse), one old series coastline (Grand Sable) and 5 sites where the MOESD intends to implement coastal protection works (Bain Boeuf, Cap Malheureux, Poudre D'Or, Grand River South East and Baie du Cap).
- (iv) Out of the above mentioned 20 beaches, 12 sites have been proposed as candidate sites for coastal conservation and recovery plan (namely Mon Choisy, Quatre Cocos, the Vale, Ile aux Cerfs, Pointe d'Esny, Bel Ombre, Le Morne, Flic en Flac, Albion, Pointe aux Sables, Albion (lighthouse) and Grand Sable)
- (v) 2 beaches out of the 12 above mentioned sites would be proposed as demonstration sites (one for physical intervention and one for non-physical intervention). Additionally 4-5 beaches would be identified for continuous monitoring.

3. Main Issues raised

- 3.1 Mr S. Onaka apprised that the progress report was the first deliverable under the project. However same was still at preliminary stage and would be finalised once the entire activities of component 1 would be completed and also necessary approval would be obtained at the level of the Japanese International Cooperation Agency (JICA) in Japan.
- 3.2 Further to enquiry from the Chairperson on the possibility to track where the sand sediment from eroded beaches was being deposited, Mr Onaka informed that this would require further studies and would be carried out in component 2 of the project.
- 3.3 Additionally in relation to beaches where sand accumulation has been noticed, Mr Prithipaul asked about where the sand sediment was being accumulated. In furtherance Mr Onaka informed that the study has considered sand sediment being accumulated on the beaches and not in the lagoon.
- 3.4 Mr Beedassy queried that during the presentation, it was understood that at Flic en Flac there was sand accretion, however at specific beach stretches in the region erosion could be noticed. Mr Onaka informed that the Flic en Flac region has been studied as a cell and on the overall sand accretion was noted, however he was aware that at certain spots there were erosion and accordingly these aspects would be taken into consideration during component 2 of the project.
- 3.5 The representative of Ministry of Public Infrastructure expressed his appreciation on the activities undertaken by the JICA team and informed that at Agalega Island severe erosion could be observed especially after the passage of cyclone Dumile. He queried on the possibility for the Japanese Experts to extend their expertise to find sustainable solution to prevent further degradation of the beaches at Agalega island.
- 3.6 The Chairman informed that in view of the budgetary constraints under the project, the scope of activities was focussed mainly to Mauritius. However as project would ensure capacity building to all the stakeholders, the knowledge acquired could be used to proposed remedial measures at Agalega Island.
- 3.7 The representative of Mauritius Oceanography Institute (MOI) informed that their Institution had undertaken preliminary surveys (beach profile and underwater

survey) at Agalega and the results had been submitted to all the relevant stakeholders accordingly.

3.8 Additionally the representative of MOI also queried on the mathematical formula used by the JET to come up with the shoreline change at different beaches. Mr Onaka informed that the results presented in the progress report were mainly based on the analysis of aerial and satellite photography and beach profiles.

3.9 Further to clarifications sought by the representative of Ministry of Housing and Lands on how to interpret the valuation results table in order to identify the beaches that would require coastal conservation plans, Mr Onaka informed that the score ranges from 1-3 and the one with the highest score would require necessary considerations.

3.10 Additionally the representative of Ministry of Housing and Lands enquired on whether proposals have been made regarding setback for developments along the coast line. Mr Onaka replied that the 30 m setback policy under the Policy Planning Guidance (PPG) was basically suitable for this moment, and at this stage no new setback policy have been proposed in the progress report.

3.11 In view of public out outcry concerning certain activities being undertaken at Trou aux Biches public beach, the Chairperson requested the JET to consider the possibility to include the type of activities that could be allowed along the beaches in the formulation of the coastal conservation plans

3.12 The representative of Ministry of Public Infrastructure (MPI) also requested to involve engineers from his institution during the design of coastal protection measures.

3.13 Further to query from Mr Kensuke on whether certain beaches were closed for bathing amongst others, the Chairperson informed that some beaches namely Baie du Tombeau and Pointe aux Sables have been declared not suitable for bathing due to the high load of E.Coli in the lagoon. Accordingly necessary sign board has been placed for public sensitisation.

3.14 Seizing the opportunity, the Chairperson requested the JET to look into the possibility to come up with protocols for sampling and water quality analysis so

as to ensure that the same methods would be used by the relevant stakeholders for common parameters.

3.15 Additionally Mr Kensuke iterated on the need to have collaboration among the Adaptation Fund Board (AFB) and Africa Adaptation Program (AAP) teams to ensure no duplication of works.

3.16 The Chairperson informed that the draft progress report has already been circulated to all the stakeholders and being still a draft the report should be used only for internal circulation.

The Chairman thanked all the members for their presence and support. The meeting ended at 11 30 hrs

February 2013

MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

Notes of Meeting of the sixth Technical Committee held on Friday 31st May 2013 at 10 00 hrs in connection with First Progress Report under the JICA Project “Capacity Building in Coastal Protection and Rehabilitation in the Republic of Mauritius”, in the Conference Room, 10th Floor, Ken Lee Tower, Barracks St, Port Louis.

Were present

Mr. P. Kallee	Deputy Director, Ministry of Environment & SD (Chairman)
Mr. R. Seenauth	Divisional Environment Officer, Ministry of Environment & SD
Mrs. D. Rajkoomar	Divisional Environment Officer, Ministry of Environment & SD
Mr. B.M.D.Kurreemun	Assistant Permanent Secretary, Ministry of Environment & SD
Mr. M.L.Magho	Environment Officer, Ministry of Environment & SD
Mrs. N. Soogun	Environment Officer, Ministry of Environment & SD
Ms. H. Ramdour	Environment Officer, Ministry of Environment & SD
Mr. N. Khedah	Project Manager, Ministry of Environment & SD
Mr. A.K.Dhoomun	Environment Enforcement Officer, Ministry of Environment & SD
Mr. P. Juddoo	Service to Mauritius, Ministry of Environment & SD
Mr. B. Ramcharrun	Divisional Scientific Officer, Ministry of Fisheries
Mrs. C.P.Aubeeluck	Tourism Planner, Ministry of Tourism & Leisure
Mr. M. Marie	Principal Technical Enforcement Officer, Ministry of Local Government & Outer Islands
Mr. B.M.Heetun	Divisional Meteorologist, Mauritius Meteorological Services
Mr. H. Cauleechurn	Inspector, National Coast Guard
Mr. G. Servansing	Technical Officer, Beach Authority
Ms. K. Cuniah	Scientific Services Section, Central Water Authority
Ms. Y. Ibrahim	Scientific Services Section, Central Water Authority
Mr. J. Mosaheb	Principle Research Scientist, Mauritius Oceanography Institute
Mr. S. Zeadally	Senior Hydrological Officer, Water Resources Unit
Dr. R.T. Ramessur	Associate Professor, University of Mauritius
Mr. P. Balloo	Head of Public Infrastructure Department, District Council of Black River
Mrs. D. Siburuth	Project Development Officer, Rivière du Rempart District Council
Mr. S. K. Seechurn	Civil Engineer, District Council of Savanne
Mr. A. Jheengut	Environment Officer, Ministry of Environment & SD (Secretary)

Japanese representatives:

Mr. H. Hashimoto	JICA Expert Team (JET)
Mr. S. Onaka	JICA Expert Team
Mr. T. Kurata	JICA Expert Team
Mr. S. Ichikawa	JICA Expert Team
Ms. H. Yoshida	JICA Expert Team
Ms. M. Citon	JICA Expert Team
Ms. N.Marie	JICA Expert Team

Absent with apologies

1. Opening of meeting

The Chairman welcomed all members present and specifically thanked the representatives of the Japanese Expert Team (JET) for their collaboration. Members were informed that the purpose of this meeting was to provide an overview, discuss and agree on the findings/recommendations of first progress report by the JET for the period June 2012 up to date so that same could be presented to the next Steering Committee for approval.

2. Approval of notes of meeting

Notes of meeting of the fifth Technical Committee held on 29 January 2013 were approved without any amendments.

3. Presentation on progress report (copy of the presentation at Annex 1)

3.1 Dr H. Hashimoto and Mr S. Onaka from JET made a presentation of the followings:

- (i) Project Progress and time frame
- (ii) Summary of Basic study
- (iii) Selection of Study Area
- (iv) Proposed Coastal Conservation Plan
- (v) Capacity Development Plan

3.2 The Salient points noted were:

- (i) Component 1 of the Project has been completed.
- (ii) Long term data (1967 to 2012) available by aerial photographs and satellite images showed that about 11% of our coasts have been eroded, 30% of our coasts have been accreting and 59% of our coasts were stable.
- (iii) Three coasts namely Albion, Bel Ombre and Mon Choisy have been eroded
- (iv) Most significant beach erosion was identified at Albion (-0.5m/year).
- (v) Percentage of living corals in the lagoon has been estimated to be 27 %. A decrease from 50 % (2001) to 27 % (2012) has been noted.
- (vi) In terms of chlorophyll concentration and turbidity: at 6 sites (namely Albion, Le Morne, Blue Bay, Ile aux Cerfs, Belle Mare and Trou d'Eau Douce) the water quality was worse, at Pointe aux Sables the water quality was bad and at Bel Ombre the water quality was within prescribed limits.
- (vii) Some potential areas located at outer reef have been identified as sand borrow sites (namely Tou aux Biches and Le Morne).
- (viii) The JET has already embarked on Component 2 of the project which relates to the elaboration of Coastal Conservation Plan. These plans would be finalised after intensive consultation with all relevant stakeholders.
- (ix) 12 sites have been proposed as candidate sites for coastal conservation

- (x) 7 sites have been proposed as demonstration/monitoring sites (one physical intervention, one non-physical intervention and 5 continuous monitoring sites)

4. Main Issues raised

4.1 Project Progress and Results of Basic Survey

- (i) Dr Hashimoto expressed his gratitude towards all the stakeholders for their collaboration and support in terms of providing data.
- (ii) The Chairman expressed his appreciation on the report and also stated that the JET has been able to collect, combine and analyse old and long time series of data/observations from all the stakeholders.
- (iii) The representative of Mauritius Oceanography Institute (MOI) reiterated their collaboration during the study and requested on the possibility to participate during the retrieval of data from the wave hunters as scheduled.
- (iv) The Chairman responded positively to the request and also informed that all the data available from JET could be made available, when same would be finalised and officialised.
- (v) Seizing the opportunity, JET requested for available data for offshore wave rider installed at Pte D'Esny by the Mauritius Meteorological Services (MMS). These data would be useful to compare the characteristics of both offshore and inshore waves.
- (vi) Mr Seenauth informed that an official request for the acquisition of the data from the MMS has already been made and same is awaited.
- (vii) Additionally, further to request from Mr S. Onaka, the representative of MOI informed that bathymetric data available for Pte d'Esny lagoon could be made available upon request.
- (viii) Dr Hashimoto also stated that in Japan 10 % of the total coastal area is eroding and 5 % is accreting. However the magnitude of erosion in Japan is approximately 1m/yr as compared to Mauritius which is 0.3 - 0.5 m /yr.
- (ix) The Chairman stated that the basic surveys showed that 59 % of our beach was stable, on the whole it was positive, however the source of sand is the coral reef and the latter is not in a good state and thus there would be a need to revitalise the coral reef ecosystem.

- (x) Additionally it was taken note that several organisations have started coral farming/transplantation on a pilot scale and this could be one potential technique to revive the coral reef.

4.2 Selection of coasts for coastal conservation plans

- (i) Dr Hashimoto informed that 12 coasts [**namely Pointe aux Canniers, Mon Choisy, Quatre Cocos/Trou d'Eau Douce, Ile aux Cerfs, Pointe d'Esny, Bel Ombre, Le Morne, Flic en Flac, Albion, Pointe aux Sables, Albion (lighthouse) and Grand Sable**] have been identified for development of Coastal Conservation Plan based on different criteria namely natural conditions, environment conditions, obstacle to land use, socio-economic values and potential future development plans. The coastal conservation plans would also include a reef conservation plan, information and education Plan and capacity development plan.
- (ii) He added that once approval for the above mentioned selected sites is obtained from the forthcoming Steering Committee, further consultation would be held with the relevant stakeholders to elaborate on the Coastal Conservation Plans.
- (iii) Dr Hashimoto also informed that the basic study has showed that Mon Choisy is an eroded coast and same has been selected solely as a continuous monitoring site as the latter is being further studied under the Adaptation Fund Board (AFB) Project.
- (iv) The representative of Ministry of Tourism and Leisure iterated that during elaboration of the coastal conservation plan, the aesthetic/visual impact of any proposed measures should be taken into account, in line with the touristic value of our coasts.
- (v) Further to a query from the representative of Ministry of Tourism and Leisure on the possibility to consider use of artificial coral reefs as one solution to coastal erosion, the Chairman informed that about 14 wrecks have been placed at different places in the lagoon as artificial reef. However we also have to consider the fact that the rejuvenating capacity of our coral reef has decreased and thus it would take long time for these artificial reefs to develop into a functional ecosystem.
- (vi) The Chairman requested the Committee to consider the possibility to include Baie du Tombeau and Bras d'Eau coastal areas in the list identified for Coastal Conservation Plan in view of their future development potential.
- (vii) In line with discussions held, the Committee approved the proposal for Coastal Conservation Plans for the above mentioned 12 selected sites and also agreed to include Baie du Tombeau and Bras d'Eau as additional sites for Coastal Conservation Plan.**

4.3 Demonstration sites

- (i) JET informed that **7 sites** (out of the abovementioned 12 sites) have been proposed as demonstration/monitoring case studies. These are
 - Grand Sable [physical intervention (dynamic revetment)]
 - Pointe d’Esny [non-physical intervention (comprehensive beach conservation, beach nourishment, setback, awareness)].
 - Mon Choisy, Ile aux Cerfs, Flic en Flac, Albion, Pointe aux Sables [continuous monitoring sites]
- (ii) The Committee took note that a **dynamic revetment** has been proposed at Grand Sable, as a demonstration site for physical intervention. This method consists of backfill with small pebbles and allow for stabilisation with vegetation (refer to photograph at *annex 2*). The method is environmentally friendly, less costly, easy to construct and provide space for beach use.
- (iii)The Committee also took note that Pointe d’Esny has been proposed as a demonstration sites for non physical intervention. The proposal consists of the development of a comprehensive beach conservation plan to include setbacks, sand nourishment, sand bypassing and application of regulations amongst others.
- (iv)In line with discussions held, the Committee agreed to JET proposals for dynamic revetment at Grand Sable, comprehensive coastal conservation plan at Pte d’Esny and to develop continuous monitoring plan for the remaining five sites.**

4.4 Capacity Development Plan

- (i) It was taken note that several on job training (beach profile survey, coral reef survey, water quality survey, amongst others) have been provided to stakeholders during component 1(basic survey).
- (ii) The JET has also provided several technical inputs on EIA Projects, amongst others.
- (iii)A seminar has been scheduled on 17 June 2013 for dissemination of the findings of the progress report to all the stakeholders including NGOs.
- (iv)It was also pointed out that there would be a technical exchange program in Seychelles in July 2013.
- (v) A workshop has been tentatively scheduled for 28 June 2013, to validate the Coastal Conservation Plans.

- (vi) A training program to be held in Japan (tentatively scheduled for December 2013) is being developed.

4.5 Other Issues

- (i) Mr Khedah expressed his appreciation on the findings of the JET and requested the latter to consider the possibility to collaborate with the AFB team during seminars and workshop, as the purpose of the both team is to ensure capacity building in the coastal zone.
- (ii) He also requested the advice of the JET on the appropriate use of formulae during the design of rock revetment.
- (iii) The Committee was also apprised of the comments and views received from several stakeholders on the progress report [refer to *annex 3*]

5. Way forward

In line with discussions held, the following recommendations could be tabled in the forthcoming Steering Committee for necessary approval:

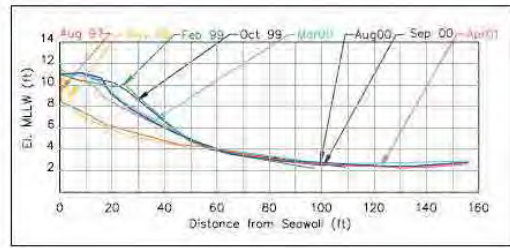
- (i) Development of Coastal Conservation Plan for **12 sites** [**Pointe aux Cannoniers, Mon Choisy, Quatre Cocos/Trou d'Eau Douce, Ile aux Cerfs, Pointe d'Esny, Bel Ombre, Le Morne, Flic en Flac, Albion, Pointe aux Sables, Albion (lighthouse) and Grand Sable**] including **Baie du Tombeau and Bras d'Eau**.
- (ii) For the following **7 sites** as demonstration/continuous monitoring sites, namely:
- Grand Sable as physical intervention demonstration site
 - Pointe d'Esny as non-physical intervention demonstration site
 - Mon Choisy, Ile aux Cerfs, Flic en Flac, Albion (sandy beach), Pointe aux Sables as continuous monitoring sites.
- (iii) Proposed dynamic revetment at Grand Sable.
- (iv) Proposed comprehensive plan (beach conservation, beach nourishment, setback and awareness) for Pointe d'Esny.

The Chairman thanked all the members for their presence and support. The meeting ended at 12 00 hrs

May 2013

Annex 2

Image of Dynamic Revetment



ANNEX 3

Comments/views from stakeholders on Progress Report

1. **Water Resources Unit** : agreeable to contents
2. **Ministry of Energy and public Utilities** : agreeable to contents
3. **District Council of Savanne:**
 - (a) Who will be responsible for the continuous monitoring of the conservation plan in relation to structural damages
 - (b) Whether training will be given to officers of local authorities
4. **District Council of Black River :**
 - (a) an in-depth study of how to increase and sustain the existing coral layer paying particular attention to coral replanting
 - (b) a coral reef management be devised laying stress on cyclone attacks
 - (c) new norms to be worked out regarding the allowable pollutants entering the sea

MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

Notes of Meeting of the 7th Technical Committee held on Friday 30th August 2013 at 10 30 hrs in connection with the JICA Project on “Capacity Building in Coastal Protection and Rehabilitation in the Republic of Mauritius”, in the Conference Room, 3rd Floor, Ken Lee Tower, Barracks St, Port Louis.

Were present

Mr. P. Kallee	Deputy Director, Ministry of Environment & SD (Chairman)
Mr R. Beedassy	Divisional Environmental Officer, Ministry of Environment & SD
Mr D. Prithipaul	Divisional Environment Officer, Ministry of Environment & SD
Mr. R. Seenauth	Divisional Environment Officer, Ministry of Environment & SD
Mr S. Buskalawa	Acting Divisional Environmental Officer, Ministry of Environment & SD
Mr. B.M.D. Kurreemun	Assistant Permanent Secretary, Ministry of Environment & SD
Mrs. N. Soogun	Environment Officer, Ministry of Environment & SD
Mr. A. Jheengut	Environment Officer, Ministry of Environment & SD
Ms. H. Ramdour	Environment Officer, Ministry of Environment & SD
Mr. M. Sardoo	Environment Officer, Ministry of Environment & SD
Mr. P. Juddoo	Service to Mauritius, Ministry of Environment & SD
Dr D. Dumur	Service to Mauritius, Ministry of Environment & SD
Miss J. Sannassy Pilly	Service to Mauritius, Ministry of Environment & SD
Mr. B. Ramcharrun	Divisional Scientific Officer, Ministry of Fisheries
Ms H Naujeer	Scientific Officer, National Parks and Conservation Service
Mr D. Bholee	Principal Conservation and Enforcement Officer, MOA (Forestry Dept)
Mrs S. Ramracheya	Technical Officer, Ministry of Local Government and Outer Islands
Mrs Y. Baguant-Moonshiram	Senior Lecturer, University of Mauritius
Mr. J. Mosaheb	Principle Research Scientist, Mauritius Oceanography Institute
Mr. S. Zeadally	Senior Hydrological Officer, Water Resources Unit
Mr S. Ramkaun	Adviser, National Development Unit
Mr. H. Cauleechurn	Inspector, National Coast Guard
Mr. G. Servansing	Technical Officer, Beach Authority
Mr. A.K.Dhoomun	Environment Enforcement Officer, Ministry of Environment & SD (Secretary)

Japanese representatives:

Mr. H. Hashimoto	JICA Expert Team (JET)
Mr. T. Kurata	JICA Expert Team
Mr T Fujita	JICA Expert Team
Mr. S. Ichikawa	JICA Expert Team
Ms. M. Citon	JICA Expert Team
Ms. N.Marie	JICA Expert Team

Absent with apology

Ministry of Tourism and Leisure
Mauritius Meteorological Services

Absent

Ministry of Housing and Lands

1. Opening of meeting

The Chairman welcomed all members present and thanked the representatives of the Japanese Expert Team (JET) for their collaboration. Members were informed that the purpose of the meeting was to apprise the members the Technical Committee of the Preliminary Design for Grand Sable and the Coastal Conservation Plan (CCP) and the proposed activities for the period (August-December) 2013.

2. Presentation on schedule of work for the period August to December 2013 , surveys to be undertaken in the context of the coastal conservation plans and the preliminary design for proposed works at Grand Sable by Dr Hashimoto (copy of the presentation at Annex 1)

2.1 Demonstration project at Grand Sable

(i) Dr Hashimoto informed of the following :

- (a) The objective of the pilot project was to protect the coast against wave overtopping and also to improve the state of the beach. The project would be implemented on about 150 m where the shoreline was low lying and a flexible revetment made of small pebbles and soil filling would be used.
- (b) The detailed design will also improve the drainage system on the coast and the materials needed to implement the project will be available locally.
- (c) The design policy takes into consideration the nature friendly measures and flexibility for future change.
- (d) The application of flexible or dynamic revetment was ideal for Grand Sable based on the nature of the beach in that area. Grand Sable lagoon features a large reef and small waves, which has resulted in the formation of a beach with fine sand. The dynamic beach in Grand Sable was also prone to the accumulation of soil and silt and therefore, the planting of mangroves at the mouths of rivers and drains will be in harmony with the natural relief of the area.
- (e) The type of revetment proposed was cheaper than rock revetment. The engineering design provide for changes in the revetment according to wave dynamics. Soft revetment would also allow for the slow percolation of the surface waters into the sea, while preventing beach erosion.
- (f) In case the pilot project provides the expected outcomes, it will be implemented in other areas with coastal erosion problems depending on the coast characteristics.
- (g) The construction works was expected to start by mid-October 2013 and be completed by the end of December 2013.

- (ii) The Chairman said that:
 - (a) In case the project is a failure, it can be easily removed to reinstate the beach to its original state.
 - (b) The project is a pilot one where the method used would be tried on an experimental basis. He informed that a consultative meeting with the village councillors of Grand Sable was held on 21st August 2013 in connection with the demonstration project which will be soon implemented in their locality. The councillors had agreed in principle for the implementation of the pilot project in their locality and in this connection, a public consultative meeting was scheduled on the 4th September 2013 at 16hrs to apprise the Grand Sable Community of the JICA demonstration project.
 - (c) An EIA was also being prepared and an application would be made for exemption of the EIA.
 - (d) The members of the technical committee were invited to attend the public consultative meeting and informed that Hon Ministers Dr. A. Boolell and Hon. S. Moutia have also been invited to attend the meeting.

2.2 Beach monitoring:

- (i) Dr Hashimoto informed that :
 - (a) Five sites among the twelve sites chosen for the development of Coastal Conservation Plan would be monitored for beach profiles, namely : Mon Choisy, Ile aux Cerfs, Albion, Flic en Flac and Pointe aux Sable.
 - (b) The management cycle would be applied, namely: issue identification, management plan, Information and education, action plan and monitoring.
 - (c) The monitoring would comprise beach survey, use of aerial photos, analysis of shoreline change, coral and water quality monitoring.

2.3 Coastal conservation plan

- (i) Dr Hashimoto said that issues raised during the last meetings held on the Coastal Conservation plan, namely on setback, design of vertical revetment and reef conservation plan would be discussed at a meeting scheduled for 19th September 2013.
- (ii) He also added that the first draft Coastal Conservation plan would be available by end of December 2013 and the final document would be ready by 2014.

2.4 Interim report

- (i) Dr Hashimoto informed that the Interim Report containing *interalia*, the result of basic study, coastal environment data base, result of coastal erosion analysis, coastal conservation plan, selection of priority coast, coastal conservation

plan for priority coast, evaluation of the plan and EIA, plan of demonstration projects, would be prepared and submitted by end of October 2013.

- (ii) He also added that a Technical Committee and a Steering Committee may be held in December 2013 to discuss on the Interim report.

2.5 Meetings :

- (i) Dr Hashimoto proposed that a Technical Committee Meeting be held on the 16th of September 2013 to discuss on the final design and EIA for Grand Sable and the Coastal Conservation Plan for Pte D’Esny .
- (ii) He further informed that the Public Consultative Meeting at Pointe D’Esny was being scheduled for the 18th of September 2013.

2.6 Main Issues raised

(i) Issues raised during the consultative meeting held on the 21st August 2013:

Jet was requested to take into consideration the main issues that were raised during the last Pre-Consultative Meeting, held with the village councillors of Grand Sable on the 21st of August 2013. These included the visual and aesthetic impact of the completed works, lighting, provision of benches and further landscaping (grass and shrub plantations). Other amenities may include the provision for the hauling of boats by the fishermen as well as permanent mooring buoys.

- (ii) **Efficiency of the flexible revetment:** To a query on whether the flexible revetment would withstand wave surges during storm conditions, Dr. Hashimoto responded that the team would investigate in the issue and monitoring would be carried out. After the demonstration project the proper size of rocks required may be amended if necessary.
- (iii) **Maintenance after the works:** it was highlighted that after the works, the project site would be handed over to the Local Authorities for maintenance purposes .
- (iv) To a query of Mr Prithipaul about non-physical measures and sand bypassing, Dr Hashimoto replied that non-physical measures concerns changes in eth legislations, and regulations and that sand bypassing is a method of transferring sand from accumulated areas to eroded areas.
- (v) The representative from MOI informed that the study on accumulation of sand off reef at Mon Choisy & Trou aux Biches were completed and a report would be submitted to the MoESD. He also stated that the next step was Albion and the MoESD would be informed accordingly on any development on the issue.
- (vi) The Chairman requested Dr. H. Hashimoto to give his point of view in relation to rock revetment as a coastal protection measure. The representative from JICA Team stated that coastal protection works should imitate nature’s works according to each coast characteristics.

- (vii) The representative of the Ministry of Fisheries informed that the region was prone to cyclonic conditions and facilities should be given to fishermen for fast removal of their boats.
- (viii) The representative from Beach Authority enquired whether there will be any structure between the pebbles and soil filling and the representative of NDU stated that the soil filling can be washed away during cyclones. Dr Hashimoto replied that geofilters would be placed between the pebbles and soil and that his team would investigate the area to know the size of pebbles to be used for the project.
- (ix) The representative from Forestry Service suggested that the project look into the possibility of introducing some plants and landscaping be considered on the filled area. The Forestry Services was requested to look into the replantation of the mountain slope.
- (x) The representative from Ministry of Fisheries suggested that NGOs should be taken on board during the project's implementation like mangroves' plantation.

3.0 The Chairman thanked all the members for their presence and support. The meeting ended at 12 00 hrs

MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

**CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND
REHABILITATION IN THE REPUBLIC OF MAURITIUS
(JICA PROJECT)**

Notes of Meeting of 8th Technical Committee held on Thursday 19 September 2013 at 14 00 hours in the Conference Room, 10th Floor, Ken Lee Tower.

Chairperson: **Mr. P. Kallee, Deputy Director Ministry of Environment and Sustainable Development (MOESD)**

Were present:

Mr. R. Seenauth	Divisional Environment Officer (DEO), ICZM Division, MOESD
Mr. R. Beedassy	DEO, Post EIA/PER Division
Mrs. D. Rajkoomar	DEO, CPI Division
Mr. R. K Foolmaun	Ag DEO, PPC Division
Mrs N. Soogun	Environment Officer (EO), ICZM Division
Mr. A. Jheengut	E.O, ICZM Division
Mr. S. Salamut	Scientific Officer, MOESD
B. Ramchurrun	DSO, Min of Fisheries
J. Aukmez	Engineer, Traffic Management and Road Safety Unit, Mauritius Public Infrastructure
S. Gunnoo	Ag. STCRO, Min of Housing and Lands
Mr. K. Bhogun	Tourism Planner, Min of Tourism and Leisure
Mr. N Seepersad	Manager, Road Development Authority
Mr. B. M. Heetun	Divisional Meteorologist, Meteorological Services
H.B. Naujeer	Scientific Officer (Conservation), National Parks and Conservation Service (NPCS)
D. Bhoollee	Principal Forest and Conservation Officer, Forestry Service
N. Nawjee	Forest Officer, Forestry Service
S. Zeadally	Senior Hydrological Officer, Water Resources Unit
G. Servansing	Technical Officer, Beach Authority
H.T. Parsad	Hydrological Officer, Water Resources Unit
H.C. Bissessur	Inspector of works, District Council Savanne
J. Bosquet	Head, Land Use and Planning Dept, Grand Port District Council
R. Ramessur	Associate Professor, University of Mauritius (UOM)
J. Mosaheb	Principal Research Scientist, Mauritius Oceanography Institute (MOI)
A. K. Khetoo	Inspector, NCG

Japan International Cooperation Agency (JICA)

Name	Designation
Dr. H. Hashimoto	Vice- Chief Advisor, JICA Expert Team
Mr S. Onaka	JICA Expert Team
Ms M. Citon	JICA Expert Team
Ms N. Marie	JICA Expert Team

Document circulated

Copy of Environmental Impact Assessment (EIA) Report “**Proposal for the Construction of a Flexible Revetment as a Demonstration Project for Coastal Protection at Grand Sable**”.

1. Opening of the meeting

- 1.1 Mr. P. Kallee welcomed all members present and specifically thanked the representatives of the JICA Team for their assistance. He informed that the purpose of this eighth Technical Committee for the JICA Project was to apprise all the stakeholders on the status of the project, to discuss on the EIA report for Grand Sable and the way forward for Pointe d’Esnay non-physical demonstration project.
- 1.2 Mr. P. Kallee then invited Dr Hashimoto and ~~M~~Mr. S. Onaka to make a presentation on the EIA for Grand Sable flexible revetment and the coastal conservation plan of Pte D’Esnay. (Refer to annex 1 for a copy of the presentation).

2.0 Main issues raised

2.1 Demonstration Project at Grand-Sable - Flexible Revetment

2.1.1 Dr Hashimoto informed of the following:

- (i) The objective of the pilot project at Grand-sable was to protect the coast against wave overtopping and also to improve the state of the beach. The project would be implemented on about 160 m where the shoreline was low lying and a flexible revetment made of small pebbles would be used. Mr. Onaka to confirm on the length of project and material as to be used
- (ii) The detailed design would also improve the drainage system on the coast and the materials needed to implement the project will be available locally.

(iii) The construction works were expected to start by mid-October 2013 and be completed by the end of December 2013.

2.1.2 The Chairman iterated the followings:

(i) The main concept of the project was presented to the Village Councilors of Grand Sable on 21 August 2013. Further to their comments and also discussions at the level of the MOESD, the JICA team agreed to extend the project stretch by 30 - 50 m. Additionally, simple toe protection would be considered at places which are at risk along the coastal road.

(ii) A consultative meeting was also held with the residents of Grand Sable Village on 16 September 2013 whereby Hon A. Boolell and Hon D. Veerasawmy were present. The purpose of the consultative meeting was to present to them the forthcoming JICA project and have their participation and acceptance right at the outset.

(iii) The Project could be considered as a community project and he requested for the collaboration and participation of all the stakeholders to ensure a successful outcome especially during the monitoring period.

2.1.3 Further to a query from the representative of University of Mauritius on the effectiveness of the dynamic revetment, the Chairman informed that the project is a pilot one where the method would be tried on an experimental basis.

2.1.4 The Chairman added that if the method is not effective, it can be easily removed to reinstate the beach to its natural state. He also stated that the timing for implementation of the dynamic revetment takes into consideration the forthcoming cyclonic period and thus monitoring would be undertaken to assess the effectiveness of the method.

2.1.5 It was taken note that a site survey was undertaken on 16 September to identify the trees that would need to be trimmed for the implementation of the dynamic revetment. Accordingly, the representative of Forestry Service iterated the need for an official request for necessary authorization. He was informed that letter has already been issued for same.

2.1.6 In line with the query of the representative of Grand Port District Council concerning the drain outlets, Dr Hashimoto informed that due consideration have been given to the size of the drainage pipe and same may be easily cleaned.

2.1.7 It was noted that JICA would follow their own tendering procedures and have proceeded through selective bidding for the construction of the flexible revetment. The deadline for submission of the bid was Tuesday 8 October 2013.

2.1.8 In order to ensure that the project is implemented as targeted, all the members were requested to provide their views and comments on the submitted EIA by 27 September 2013. It was stressed that if no views or comments were available

by that date, it would be assumed that there is no-objection from the stakeholders. Official letter would follow.

3.0 Demonstration Project at Pointe d'Esny- Comprehensive Beach Conservation Plan

3.1 Mr. S. Onaka informed the followings:

- (a) A comprehensive beach conservation plan has been proposed for Pointe d'Esny area taking into account the mechanism of littoral drift.
- (b) Most of the areas at Pte D'Esny are leased and basically each lessee shall take care the beach conservation. However same are being taken in a piecemeal manner.
- (c) It was discussed that there would be a need for the consensus building between the lessees for an integrated beach conservation measures.
- (d) Proposals were made to have discussions with all the stakeholders on an ongoing basis to ensure that development of an effective beach conservation plan. The discussions would start as from the first week of October.

3.2 The representative of Ministry of Housing and Lands stated that in practice coastal protection works are undertaken on public beaches and state land. In furtherance, he queried on the existence of any policy decision, allowing for coastal protection works by Government on leased of private sites.

3.3 The Chairman informed that there is not such policy decisions, however he requested the members to continue with the discussions on the development of a conservation plan for Pointe d'Esny. Based on the progress, timely decisions would be undertaken.

3.4 The representative of University of Mauritius stated that upon the development of the plan, there would be a need to have acceptance from the lessees to implement same.

3.5 Mr. Onaka informed that the plan would not be imposed to lessees and during the development of the plan there would be several consultations with the lessees of Pointe d'Esny area.

3.6 It was agreed that all the stakeholders would participate during the discussions in October for Pointe d'Esny.

4.0 The Chairman thanked the members present. The meeting ended at 16 00 hrs.

19 September 2013

**MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT
CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND
REHABILITATION IN THE REPUBLIC OF MAURITIUS
(JICA PROJECT)**

Notes of Meeting of 9th Technical Committee held on Thursday 5th December 2013 at 14 00 hours in the Conference Room, 3rd Floor, Ken Lee Tower, Barracks St Port Louis .

Chairperson: Mr. P. Kallee, Deputy Director Ministry of Environment and Sustainable Development (MOESD)

Were present:

Mr S Mooloo	Deputy Director, Ministry of Environment and SD
Mr. R. Seenauth	Divisional Environment Officer (DEO), ICZM Division, MOESD
Mrs. D. Rajkoomar	DEO, CPI Division
Mrs N. Soogun	Environment Officer (EO), ICZM Division
Mrs C G Jokhoo	Principal State Counsel , Attorney General Office
Mr B Dwarka	Tourism Planner , Ministry of Tourism and Leisure
Mr C N Paupiah	Senior Scientific Officer , Ministry of Fisheries
Mr S Ramah	Technical Officer , Ministry of Fisheries
G. Servansing	Technical Officer, Beach Authority
Mr O Gooroochurn	Associate Research Scientist, Mauritius Oceanography Institute
Mr. B. M. Heetun	Divisional Meteorologist, Meteorological Services
Mr H T Parsad	Hydrological Officer , Water Resources Unit
Mr H Gopaul	Engineer , Wastewater Management Authority
Mr H Caulteechurn	Inspector of Police , National Coast Guard
Mr W S Gopal	Ag Senior Building Inspector , Grand Port District Council
Mr M S Sairally	Head of Public Infrastructure Dept , Grand Port District Council
Mr N Langur	Chief Health Inspector , District Council of Riviere du Rempart
Mr P Balloo	Head Public Infrastructure Dept, Black River District Council
Mr A Reesaul	Head of Public Infrastructure Dept , District Council of Flacq
Mr S K Seechurn	Civil Engineer, District Council of Savanne
Ms J Sanassy Pilly	Service To Mauritius , Ministry of Environment and SD

Japan International Cooperation Agency (JICA)

Name	Designation
Mr K Ichikawa	JICA Expert Team
Mr S. Onaka	JICA Expert Team
Ms K Takahashi	JICA Madagascar Office
Ms H Yoshida	JICA Expert Team
Mr N Sumoodhee	JICA Expert Team
Ms S Mungroo	JICA Expert Team

Document circulated

Copy of Interim Report in CD

1.0 Opening of the meeting

1.1 Mr. P. Kallee welcomed all members present and specifically thanked the representatives of the JICA Team for their assistance in coastal protection works . He informed that the purpose of this ninth Technical Committee for the JICA Project was to apprise all the stakeholders on the status of the project and the Interim report .

1.2 The Chair then invited Mr. S. Onaka to make a presentation on Interim Report (Refer to annex 1 for a copy of the presentation).

2.0 Approval of Notes of meeting

2.1 The Notes of meeting held on the 19th September 2013 was read and approved without amendments .

3.0 Matters arising

3.1 Mr Onaka thanked all members to give JICA a chance to present their activities. He gave a brief presentation on the contents of the Interim Report as follows:

- (i) Outline of activities
- (ii) Demonstration project
- (iii) Schedule for second stage

3.1.1 Outline of activities

- (i) The basic study has been completed
- (ii) The Formulation of the Coastal Conservation plans started in September 2012 and was ongoing.

3.1.2 Demonstration project

- (i) In the context of the demonstration project 7 priority coasts have been chosen.
- (ii) Grand Sable and Pte d'Esny have been chosen as demonstration project and Mon Choisy, Albion, Pointe Aux Sable, Flic en Flac and Ile aux Cerfs have been chosen for monitoring of beach profiles.

(iii) Demonstration Project at Grand-Sable - Flexible Revetment

- The detailed survey has been carried out
- EIA was submitted and approved

- Consultation meeting was held 21st August 2013 and 16th September 2013 prior to finalizing design
- Beach clean- up campaign was held on 20 October 2013
- Construction started in October 2013 and was expected to be completed by mid December 2013.
- Following completion continuous monitoring would be carried out every week through photographic surveys by the local people and beach profile changes would be carried out by the MOESD/JICA/MHL/BA /MOI every three months or after cyclones /storm swells event
- Following results of monitoring and evaluation would be carried out and a guideline prepared. If successful, the technique would be applied to others coasts.
- The project is on an experimental basis. 250 m of coast have been protected by making use of the flexible revetment . Over half of the site only gravel have been used and the other half comprise of gravel and rocksand. The objective is also to compare the effectiveness of the gravel and the mix gravel and rocksand.

(iv) Demonstration project at Pte D’Esny

- The coastal conservation plan would be prepared in collaboration with stakeholders .
- In the first stage, the coastal problems were identified and understood.
- At the second stage , the basic policy and adaptation measures would be developed
- The coastal conditions at Pte d’Esny was rather stable on the overall.
- Brief basic policies would include the following
 - ✓ Sand is common property
 - ✓ Present conditions be kept
 - ✓ Existing regulations on coastal zone management be clarified .

(v) Monitoring

- The following five sites have been chosen for beach profile monitoring : Mon Choisy, Albion, Pointe aux Sables, Flic en Flac and Ile aux Cerfs .
- The objective was to obtain basic information and to carry out technological transfer.
- A monitoring team has been set up comprising MOESD/JICA , MHL, BA and MOI
- Monitoring would be carried out every three months for each site .

3.1.3 Schedule for second phase

- The team would be back as from March 2014.
- The CCP would be finalized in August 2014 and evaluation carried out by December 2014
- Monitoring of the demonstration project would be carried out up to June 2015

4.0 Discussions

- (i) The representative of the MOI informed that they have started beach profile monitoring and current surveys every six months at Mon Choisy, Flic en Flac, St Felix and Belle Mare . Therefore there was a necessity for synchronization of activities so as to avoid duplication. The Chair replied that the monitoring team also includes the MOI and there should be no duplication. For sites chosen under the JICA project, it would be preferable that the surveys be carried out by the monitoring team . A letter would be issued to the MOI accordingly on same.
- (ii) Mr Seenauth informed the members that at one of the meeting of the ICZM Committee, decision was taken not to lease sand accumulation areas. He also said that the contribution of JICA was acknowledged by the Hon Minister of Environment & SD during the meetings of the Committee of Supply in the context of budget discussions.
- (iii) The Chair also said that during the COP meeting of the climate change convention held in Poland , he also acknowledged the contribution of JICA . He also handed over a copy of his speech to the JICA representatives.
- (iv) **It was agreed that members would submit their views/comments on the Interim report by the 31st December 2013.**

5.0 Closing

- The Chairman thanked the members present.
- The meeting ended at 16 10 hrs.

12 December 2013

**MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT
CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND
REHABILITATION IN THE REPUBLIC OF MAURITIUS
(JICA PROJECT)**

Notes of Meeting of 10th Technical Committee held on Monday 7th April 2014 at 13 00 hours in the Conference Room, 3rd Floor, Ken Lee Tower, Barracks St Port Louis .

Chairperson: Mr. S. Mooloo, Deputy Director Ministry of Environment and Sustainable Development (MOESD)

Were present:

Mr. R Seenauth	Divisional Environment Officer (DEO), ICZM Division, MOESD
Mr. Y. Pathel	DEO, ELP Division, MOESD
Mr. K Heeramun	DEO, PP Division, MOESD
Mr. D Prithipaul	DEO, CPI Division, MOESD
Mr. B M D Kurreemun	APS, MOESD
Mr. A. Jheengut	Environment Officer (EO), ICZM Division
Ms H Ramdour	Environment Officer (EO), ICZM Division
Dr R Ramessur	Associate Professor, UOM
Mrs. C G Jokhoo	Principal State Counsel , Attorney General Office
Mr. C N Paupiah	Senior Scientific Officer , Ministry of Fisheries
Mr. T Abdool	Environment Officer (EO), SD Division
Mr. D Vithilingum	Environment Officer (EO), EIA/PER Monitoring Division
Mr. S Salamat	Scientific Officer, MOESD
Mr. R Soborun	Senior Planner, Min of Housing and Lands
Mr. G Servansing	Technical Officer, Beach Authority
Mr. J Mosaheb	Research Scientist, Mauritius Oceanography Institute
Mr. R Virasami	Meteorologist, Meteorological Services
Mr. H Gopaul	Engineer , Wastewater Management Authority
Mr. R Dookbhunjun	Inspector of Police , National Coast Guard

Mr. W S Gopal	Ag Senior Building Inspector , Grand Port District Council
Mr. N Roopun	Ag Chief Inspector of Work, Savanne District Council
Mr. J F M Enouf	Ag Principal Health Inspector , District Council of Riviere du Rempart
Mr. P Balloo	Head Public Infrastructure Dept, Black River District Council
Mr. S K Seechurn	Civil Engineer, District Council of Savanne

Japan International Cooperation Agency (JICA)

Name	Designation
Dr H. Hashimoto	JICA Expert Team
Mr. S Ichikawa	JICA Expert Team
Ms S Mungroo	JICA Expert Team

1.0 Opening of the meeting

1.1 Mr. S. Mooloo welcomed all members present and specifically thanked the representatives of the JICA Team for their assistance in coastal protection works. He informed that the purpose of this tenth Technical Committee for the JICA Project was to apprise all the stakeholders on the status of the project and the way forward.

2.0 Approval of Notes of meeting

2.1 The Notes of meeting of the ninth Technical Committee held on the 5th December 2013 was read and approved without amendments.

3.0 Presentation by JICA

3.1 The Chair invited Dr H. Hashimoto, to make a presentation on status of the project and the way forward (Refer to **annex 1** for a copy of the presentation).

3.2 Dr Hashimoto thanked all members for their presence and collaboration. The salient features of the presentation were as follows:

- (i) Outline of activities
- (ii) Demonstration project
- (iii) Schedule for second stage

3.2.1 Project components

- (i) Component 1 : the basic study has been completed
- (ii) Component 2: formulation of the Coastal Conservation plans started in September 2012 and was ongoing.
- (iii) Component 3 : technical transfer related to coastal management is ongoing
- (iv) Component 4 : demonstration projects are ongoing

3.2.2 Project Activities from December 2013 - up to date

- (i) Beach profile monitoring of beaches (for instance Mon Choisy, Albion, Pointe aux Sables, Flic en Flac and Ile aux Cerfs, amongst others). A monitoring team has been set up (comprising MOESD/JICA, MHL, BA and MOI) and monitoring would be carried out every three months for each site.
- (ii) Wave hunters and current meters have been installed at Pointe d'Esny and Grand Sable lagoon to understand wave dissipation at reef in order to come up with appropriate planning and design measures.
- (iii) Working sessions were being held with all the relevant stakeholders (24 March – 10 April 2014) on the coastal conservation plans being proposed for 12 sites around Mauritius.

3.2.3 Demonstration Project at Grand-Sable - Flexible Revetment

- (i) Construction of flexible revetment was completed in December 2013.
- (ii) Monitoring and assessment of the structure was being carried out together with the MOESD and the local people of Grand Sable.
- (iii) The flexible revetment is a cost effective method that could be applied to other areas of Mauritius where there were risk of wave overtopping and high risk of storm surge.

3.2.4 Demonstration project at Pte D'Esny

- (i) The coastal conservation plan would be prepared in collaboration with stakeholders.
- (ii) The basic policy and adaptation measures would be developed and would focus mainly on improvement existing structures, proposal on setback policies, application of existing regulations and possibilities for sand by pass.

3.2.5 Future activities

- (i) The CCP would be finalized in August 2014 and evaluation carried out by December 2014. The CCP would cover the coastal protection and rehabilitation plan, coastal maintenance plan, coral reef conservation plan amongst others.
- (ii) Seminar is being proposed in September 2014
- (iii) Monitoring of the demonstration projects would be carried out up to June 2015
- (iv) Coastal engineering guidelines would also be proposed.

4.0 Discussions

4.1 Demonstration Project at Grand Sable

- (i) Further to a query of the Chairman on the effectiveness of the flexible revetment at Grand Sable, Dr Hashimoto stated the following :
 - The flexible revetment was stable.
 - Wave run up along the coastal road has decreased especially during the recent passage cyclone Bejisa
 - Beach use has increased in terms of walking, fishing, amongst others.
 - The quality of the water has improved and foul smell has diminished.
 - Seepage along the structure was efficient during the heavy rainfall, however the drainage provided on the revetment was insufficient to contain the flood and same would be improved.
- (ii) Mr. Seenauth also reported that a consultative meeting with the inhabitants of Grand Sable was held on 1st April 2014 and the inhabitants were satisfied with the project. The residents were of the opinion that foul odor had decreased and the recreational activities along the coastal stretch had improved.
- (iii) The Chairman was of the opinion that the flexible revetment method could be replicated at other places around Mauritius and Dr Hashimoto concurred with same.

4.2 Demonstration Project at Pointe d'Esny

- (i) In relation to proposed coastal Conservation Plan at Pointe d'Esny, Mr. Seenauth stated that a consultative meeting was held with the inhabitants of Pointe d'Esny to discuss on

the proposals. Some of the lessees were of the opinion that the accumulated sand in front of their bungalow were under their jurisdiction.

- (ii) The representative of Ministry of Housing and Lands informed that they are aware of the issue of sand accumulation in front of leased sites and as far as possible the accumulated part was not leased.
- (iii) Upon inquiry on whether sand from bungalow sites could be considered as a Government property, the representative of State Law Office informed that same would need to be investigated and requested for an official letter.

4.3 Future Activities

- (i) In line with the proposed seminar scheduled for September 2014, Mr. Seenauth pointed out that there was a proposal to organize the seminar jointly with the landslide team so that all the stakeholders are aware of all the activities being undertaken by the JICA landslide and coastal erosion team.
- (ii) Mr. Seenauth also pointed out that the draft final report for the project is expected by March 2015.
- (iii) In relation to beach profile survey being carried out under the JICA project, the chairperson iterated the need to have the participation of surveyors from the Ministry of Housing and Lands.
- (iv) The representative of the MOI informed that they are undertaking beach profile monitoring and current surveys at various beaches on a regular basis (Mon Choisy, Flic en Flac, St Felix and Belle Mare). Accordingly, there was a necessity for synchronization of activities so as to avoid duplication. The Chair replied that the monitoring team also includes the MOI and there should be no duplication. For sites chosen under the JICA project, it would be preferable that the surveys be carried out by the monitoring team. A letter would be issued to the MOI accordingly on same.
- (v) Concerning proposal for engineering guideline under the project, the chairperson requested the JICA team to look into the possibility to develop a guideline for identification and extraction of offshore sand.

4.4 Other issues

- (i) Upon query of the Chairman on the status of coral reef around Mauritius, the representative of Fisheries reported that the survey undertaken by the Albion Fisheries Research Centre (AFRC) showed a decrease in the percentage of live coral during the past ten years and there would be a need to come up with concrete measures to enhance coral growth.

- (ii) The representative of University of Mauritius also stated that during a recent workshop carried at the University of Mauritius, it was taken note that the live coral in the lagoon has decreased and measures would need to be undertaken accordingly.
- (iii) Further to an inquiry from the Chairman on whether in Japan an Environmental Impact Assessment Licence for coastal protection works were required, Dr Hashimoto reported that environmental impact assessment are carried out, however the requirement for licence or authorization was dependent on the regulations of different prefectures.

5.0 Closing

- The Chairman thanked the members present.
- The meeting ended at 15 00 hrs.

15 April 2014

**MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT
CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND
REHABILITATION IN THE REPUBLIC OF MAURITIUS
(JICA PROJECT)**

Notes of Meeting of 11th Technical Committee held on Monday 9th June 2014 at 14 00 hours in the Conference Room, 3rd Floor, Ken Lee Tower, Barracks St Port Louis .

Chairperson: Mr. S. Mooloo, Deputy Director Ministry of Environment and Sustainable Development (MOESD)

Were present:

R Seenauth	Divisional Environment Officer (DEO), ICZM Division, MOESD
Y Pathel	DEO, ELP Division, MOESD
K Heeramun	DEO, PP Division, MOESD
D Prithipaul	DEO, CPI Division, MOESD
D Boodhun	DEO, I&E Division, MOESD
R K Foolmaun	Ag. DEO, PPC Division, MOESD
D S Chamilall	Ag. DEO, CC Division, MOESD
N Khedah	Project Manager, MOESD
V Clair	Ag APS, MOESD
N Soogun	Environment Officer (EO), MOESD
D Tatur Ramasamy	EO, MOESD
A. Jheengut	EO, MOESD
H Ramdour	EO, MOESD
S D Jowahir	EO, MOESD
I Auliar	EO, MOESD
S Salamut	Scientific Officer, NEL, MOESD
A K Dhoomun	Environment Enforcement Officer, MOESD
Dr R Ramessur	Associate Professor, UOM
R Soborun	Senior Planner, Min of Housing and Lands

N Roomaldawo	Technical Officer , Ministry of Fisheries
G Servansing	Technical Officer, Beach Authority
J Mosaheb	Principal Research Scientist, Mauritius Oceanography Institute
R Virasami	Ag. Divisional Meteorologist, Meteorological Services
H B Naujeer	Scientific Officer, National Parks Conservation Society
H Gopaul	Senior Engineer , Wastewater Management Authority
S Zeadally	Senior Hydrological Officer, Water Resources Unit
R Dookbhunjun	Inspector of Police , National Coast Guard
W S Gopal	Ag Senior Building Inspector , Grand Port District Council
J F M Enouf	Ag Principal Health Inspector , Riviere du Rempart District Council
M F Joomratty	Senior Inspector of Work, Black River District Council
N Roopun	Ag Chief Inspector of Work, Savanne District Council

Japan International Cooperation Agency (JICA)

Name	Designation
S Onaka	JICA Expert Team (JET)
S Ichikawa	JET
M Sakuraba	JET
M Itsui	JET
M Sugita	JET
S Mungroo	JET

1.0 Opening of the meeting

- 1.1 Mr. S. Mooloo welcomed all members present and specifically thanked the representatives of the JICA Team for their presence. He informed that the main purpose of this eleventh Technical Committee for the JICA Project was to apprise all the stakeholders on the status of the project, to discuss on the proposed coastal conservation plans and the way forward.

2.0 Approval of Notes of meeting

2.1 The notes of meeting of the tenth Technical Committee held on the 7 April 2014 was read and approved without amendments.

3.0 Presentation by JICA

3.1 The Chairperson invited Mr. S. Onaka to make a presentation on the status of the project, to provide an overview of the coastal conservation plans and the way forward.

3.2 Mr. Onaka thanked all members for their presence and collaboration. The salient features of the presentation were as follows:

3.2.1 Status and Outline of main activities

(i) The project was in its second phase and the main activities would be as follows :

- preparation of concrete coastal conservation plan (CCP) for 12 coasts;
- continuous monitoring of Grand Sable Demonstration project (flexible revetment);
- beach profile monitoring every three months at selected sites by the MOESD;
- preparation of CCP for Pointe d’Esny ;
- preparation of Progress Report 2;
- analysis of wave and current observation;
- preparation of technical guidelines (coral monitoring, EIA amongst others).

(ii) Overview of Coastal Conservation Plans

- Coastal conservations measures for six coastal stretches (namely Pointe d’Esny, Mont Choisy, Pointe aux Cannoniers, Albion, Pointe aux Sables and Grand Sable) were discussed.

(iii) Proposals for preparation of technical guidelines

- An overview of available reference materials on coastal guidelines were provided
- Contents of the proposed technical guidelines on coastal measures and beach monitoring for Mauritius were also discussed.

(iv) Progress Report 2

- A second progress report was being prepared as scheduled under the Project and same would be submitted by end of July 2014.

4.0 Main Issues

4.1 Coastal Conservation Plan (CCP) for Pointe d'Esny

- (a) Mr. Onaka stated that for the purpose of CCP, the Pointe d'Esny area has been divided into three zones and the main proposed measures at each zones were as follows :
 - (i) **Zone 1:** removal of certain groins and concrete retaining walls.
 - (ii) **Zone 2:** improvement of existing seawall, beach recharge and groin modification.
 - (iii) **Zone 3:** improvement of existing groin and sand bypass.
- (b) Further to a query from the Chairperson on the date of construction of existing groins at Pointe d'Esny, Mr. Onaka stated that this information was not available. However, Mr. Onaka added that as per available satellite images, some of the groins existed in the year 1967.
- (c) The Chairperson asked Mr. R. Soborun of Ministry of Housing and Lands to check at the level of his Ministry on the availability of older satellite images.
- (d) In view of the presence of officers with technical background in the meeting, the Chairman requested Mr. Onaka to provide further technical justifications of the measures proposed and on the liabilities in case the measures would fail. Accordingly, Mr. Onaka stated the followings :
 - (i) The possible causes of erosion and measures proposed were based on site surveys, analysis of shoreline change through available satellite images (1967- 2008) and, aerial photographs, discussion with stakeholders including lessees , and collection of wave and current data;
 - (ii) Based on the above information and numerical modeling, four key groins that influence the longshore drift (from South to North) were identified and same could be retained during the implementation of the remedial measures. The remaining groins could be removed to improve beach use.
 - (iii) The coastal area is a very dynamic zone and risk of liabilities exists. Accordingly there would be a need to undertake monitoring on a continuous basis to ensure necessary actions are taken to remedy the situation.
- (e) Upon a query of the Chairman on the perceptions of the lessees on the proposed measures, Mr. Onaka reported that the responses were mixed. Some of the lessees were reticent to the proposed measures, especially to the removal of groins. He also added that the latter were of the opinion that the existing groins were functional and removal of these structures was not advisable.

- (f) In furtherance, the Committee agreed that there would be a need for strong justifications with scientific back up for the proposed measures proposed especially to the removal of the groins. This will ensure smooth implementation and acceptance of the measures.
- (g) Further to query from Mr. Khedah on shoreline change model used and whether the Swan model could have been used, Mr. Onaka informed the following:
- The JICA team has used the one line model, which is a very simple model to predict shoreline change.
 - The Swan Model is also a very good model, however other data such as wave field, height and direction were required.
- (h) The Chairperson pointed out that the results of the model were based on normal sea conditions and inquired on whether the scenarios during extreme weather conditions have been considered.
- (i) Accordingly, Mr. Onaka informed that it was difficult to emulate a scenario of extreme weather conditions with the numerical models used.
- (j) The Chairperson emphasized on the need to have models for extreme weather conditions to ensure that the measures proposed was justified.
- (k) In line with a query from Mr. J. Mosaheb of Mauritius Oceanography Institute (MOI) on whether the causes of accumulation and erosion were identified before proposing remedial measures, Mr. Onaka stated that the measures were proposed based on data collected (aerial and satellite images and, wave and current data available from wave hunters and current meters) and also based on site visits effected.
- (l) Mr. Onaka also added that the causes of erosion and measures to be implemented were site specific.
- (m) Further to a query from Mr. Pathel on the cost implication for the proposed sand bypassing measure, Mr. Onaka stated that the costs were being worked out and for Pointe d'Esny area it would involve only transportation costs for the proposed sand bypass.
- (n) In relation to accumulated areas at Zone 3, the Chairperson pointed out there was a need to identify the lessees' boundary limit in order to ensure that the sand would be removed outside the leased sites.
- (o) Mr. Seenauth informed that removal of sand from the accumulated areas was a sensitive issue and iterated the need for strong justifications for sand bypass.
- (p) Further to a query from the Chairperson on how the limit of the leased site were determined in line with the fluctuations of the high water mark (hwm), the representative of Ministry of Housing and Lands (MHL) informed that sites were leased based on actual high water mark at time of lease and a 30 m setback was ensured for hard structures.
- (q) The representative of MHL also added that based on recommendations from the MOESD, no leases were being granted on accumulated areas.

- (r) Dr Ramessur of University of Mauritius (UOM) pointed that the effectiveness of the proposed measures at Pointe d'Esny should take into account climate change effects such as sea level rise and extreme events.
- (s) In furtherance, the Chairman stressed on the need for sound scientific justification of the proposed measures.

4.2 Coastal Conservation Plan at Pointe aux Sable and Albion

- (i) Mr. Onaka highlighted that for Pointe aux Sable and Albion coastal stretches, the measures proposed would emphasize on beach recharge through sand bypassing, setback policy of 30 meters and no structural interventions were being proposed.
- (ii) Upon inquest from the Chairman on whether any measures were being proposed within the lagoon or near the reef system in the form of seawalls or breakwaters, Mr. Onaka commented the following :
 - most of the measures have been proposed on the shore as short term measures however in the long term intervention in the sea could be envisaged; and
 - certain interventions in the terms of breakwaters and groins have been planned for the North and East of Pointe aux Cannoniers area respectively. However, necessary decisions would need to be taken on who will be responsible for the implementation of these structures.

4.3 Coastal Conservation Plan at Mon Choisy

- (i) Mr. Onaka explained that erosion has been noted on the South part and structural intervention in terms of breakwaters and or groynes could be considered. However, the JICA team was proposing beach recharge to keep the natural sandy beach state.
- (ii) Mr. Khedah highlighted that the public beach in question is very popular amongst the Mauritian and there was a need to have a systematic approach toward proposing short term and, long term measures and also ensure the sustainability of those measures.
- (iii) He added that various measures could be implemented in the short term, such as beach fill using shoreline stabilization techniques, retreat, breakwaters amongst others. However, there was a need for capacity enhancement for long term sustainable solutions.
- (iv) Mr. Prithipaul iterated the need to have a synergy between the AFB and JICA Projects.

4.4 Preparation of Technical Guidelines

- (i) Mr. Onaka indicated that in line with the capacity building component of the project, various technical guidelines (beach monitoring, EIA Guideline, coral reef monitoring

guidelines, amongst others) would be prepared in collaboration with the relevant stakeholders.

- (ii) He also drew the attention that there are several coastal guideline documents available and these could be adapted to the Mauritius context.
- (iii) The Chairman advised that the technical guidelines should take into consideration extreme weather conditions and also cover post monitoring issues.
- (iv) The representative of NPCCS questioned on whether the design of breakwaters and groins would be included in the technical guidelines. Accordingly, Mr. Onaka informed that the design would be at a preliminary level.
- (v) Mrs. Soogun emphasized the need to have detailed information on the design of the structures especially for those proposed at Pointe aux Cannoniers.
- (vi) The Chairperson said that Baird Report should also be considered when developing the coastal guidelines and the designs of breakwaters/groins.

4.5 Calculation of Wave Run up

- (i) Further to a query from the Chairman on the highest wave height recorded in the lagoon at Pointe d'Esny, Mr. Sakuraba established that the highest wave recorded in the lagoon of pointe d'esny was around 0.3 m. He added that the coral reefs helps to dissipate around 50 -70 % of the wave energy entering the lagoon.
- (ii) The Chairman suggested that there was a need to look into the possibility to have historical wave data for extreme cyclones (such as Carol, Gervaise) in order to help us to gauge the impacts of violent cyclones on the shoreline.

5.0 Closing

- The Chairman thanked the members present.
- The meeting ended at 16 00 hrs.

**MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT
CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND
REHABILITATION IN THE REPUBLIC OF MAURITIUS
(JICA PROJECT)**

**Notes of Meeting of 12th Technical Committee held on Thursday 31st July 2014
at 10 00 hours in the Conference Room, 3rd Floor, Ken Lee Tower, Barracks
St Port Louis**

Chairperson: Mr. S. Mooloo, Deputy Director Ministry of Environment and Sustainable Development (MOESD)

Were present:

Mr. R Seenauth	Divisional Environment Officer (DEO), ICZM Division, MOESD
Mr. K Heeramun	DEO, PP Division, MOESD
Mr. Y. Pathel	DEO, ELP Division, MOESD
Mr. R. Beedassy	DEO, EIA/PER Monitoring Division, MOESD
Mrs. D. Boodhun	DEO, Information and Education Division, MOESD
Mrs. N. Soogun	EO, MOESD
Ms. V. Kanhye	EO, MOESD
Mr. M. L. Magho	EO, MOESD
Mrs. R. Sadayen	EO, MOESD
Mr. S. Buskalawa	EO, MOESD
Mrs. I. Auliar	EO, MOESD
Ms. Sannassy Pilly S	STM Intern, MOESD
Mr. J. Mosaheb	Principal Research Scientist, Mauritius Oceanography Institute
Mr. S. Gunnoo	Senior Planner, Min of Housing and Lands
Mr. J Ramen	Technical Officer, National Parks and Conservation Society
Mrs. N Roomaldawo	Technical Officer , Ministry of Fisheries
Mr. S Zeadally	Senior Hydrological Officer, Water Resources Unit
Mr. S Salamut	Scientific Officer, MOESD

Mr. R Gowreea	Beach Works Inspector, Beach Authority
Mr. R Virasami	Meteorologist, Meteorological Services
Mr. D Cyparsade	Enforcement Officer, Min of Local Government
Mr. H Gopaul	Engineer , Wastewater Management Authority
Mr. H Cauleechurn	Inspector of Police , National Coast Guard
Mr. D Koonjul	Planning and Development Officer, City Council of Port Louis
Mr. W S Gopal	Ag Senior Building Inspector , Grand Port District Council
Mr. J F M Enouf	Ag Principal Health Inspector , District Council of Riviere du Rempart
Mr. M F Soowratty	Senior Inspector of Works, Black River District Council
Mr. A. Jheengut	Environment Officer (EO), MOESD

Japan International Cooperation Agency (JICA)

Dr. H. Hashimoto	JICA Expert Team (JET)
Dr S. Nojima	JET
Dr. T. Kurata	JET

1.0 Opening of the meeting

- 1.1 Mr. S. Mooloo welcomed all members present and specifically thanked the representatives of the JICA team for their presence.
- 1.2 He informed that the main purpose of this Technical Committee for the JICA Project was to apprise all the stakeholders on the status of the project, to discuss on the proposed coastal conservation plans, proposal for development of EIA and coral reef monitoring guidelines, progress report 2 and way forward.

2.0 Approval of Notes of meeting

- 2.1 The notes of meeting of the eleventh Technical Committee held on the 9 June 2014 was read and approved without amendments.

3.0 Matters Arising

- 3.1 In relation to availability of old aerial photos, the representative of Ministry of Housing and Lands (MHL) informed that aerial photos before the year 1967 was not available at their level.
- 3.2 The Chairman informed that as far as he recalled earlier satellite images could be available under a project undertaken by the Ministry of Housing and Lands namely ‘the **hunting** survey aerial photography’. He accordingly, requested the representative of Ministry of Housing and Lands to enquire on same.
- 3.3 In relation to availability of historical wave data, the representative of Mauritius Meteorological Services (MMS) informed that wave data at certain places were available as from the year 1997.
- 3.4 Concerning availability of historical data on atmospheric pressure and wind speed, the representative of MMS report that same could be available upon official request.
- 3.5 Dr Hashimoto apprised that the historical atmospheric and wind speed data could be useful to estimate the wave characteristics through hindcasting approach. He also added that same would be discussed during his next mission in October 2014.

4.0 Presentation by JICA

- 4.1 Dr H. Hashimoto thanked all members for their presence and collaboration. The salient features of the presentation were as follows (copy of the presentation is at annex 1):

4.2.1 Status and Outline of main activities

(a) The project was in its second phase and the main activities would be as follows :

- preparation of coastal conservation plan (CCP) including designs for 12 coasts;
- continuous monitoring of Grand Sable Demonstration project ;
- beach profile monitoring every three months at selected sites by the MOESD;
- finalization of Progress Report 2;
- analysis of wave and current observation;
- preparation of technical guidelines (coral monitoring, EIA amongst others).

(b) Overview of Coastal Conservation Plans

- Coastal conservations measures for six coastal stretches (namely, Bras d'Eau, Trou d'Eau Douce, Bel Ombre, Baie du Tombeau, Le Morne and Flic en Flac) were discussed.

(c) Proposals for preparation of Environment Impact Assessment and coral reef monitoring guidelines

- Improvement of existing guideline and checklists on coastal developments available at the level of the Ministry of Environment and Sustainable Development, taking into consideration past EIA projects, climate change impacts.
- Development of protocol to assess and monitor coral reef health and development of coral reef management plan.

(d) Progress Report 2

- in line with the delivery of the project, the second progress report has been prepared and the views of the stakeholders would be important to finalize same.

5.0 Main Issues

5.1 Coastal Conservation Plan (CCP) for Bras d'Eau public beach

- (a) Dr Hashimoto informed the following :
- (i) Bras d'Eau pb is accreting in total with localized erosion (near toilet block).
 - (ii) Analysis of aerial and satellite images have shown a decrease in the extent of mangroves and seagrass areas within the lagoon. Consequently, this could be one of the causes of erosion in front of the toilet block.
 - (iii) The main rehabilitation measures would be relocation of toilet block, sand bypass and development of reef and mangrove conservation plan.
- (b) Further to a query from the Chairperson on the impact of the toilet block on beach erosion, Dr Hashimoto stated that the toilet block is not contributing towards erosion, however same could be at risk especially during cyclonic conditions and relocation would be proactive measure.

- (c) Based on the explanation of Dr Hashimoto, the Chairman was of the opinion that there would be a need to replant mangrove in order to control erosion. Dr Hashimoto agreed to same and added that seagrass conservation actions would also be required.

5.2 Coastal Conservation Plan at Trou d'Eau Douce

- (a) Dr Hashimoto informed the following :
 - (i) The Trou d'Eau Douce sediment cell is accreting in total with localized erosion (near Tropical Attitude hotel).
 - (ii) Main causes of erosion could be attributed to presence of vertical structures (groynes, boundary walls) on the beach dynamic zone and also loss of corals.
 - (iii) Analysis of satellite images has shown that at location where there was growth of corals, accretion of sand along the beach was noted.
 - (iv) The main rehabilitation measures would be adherence to setback policy, improvement of vertical structure within the beach dynamic zone and coral reef conservation.
- (b) Further to query from the Chairman on possible explanations for the extensive growth of the corals in the lagoon where accretion along the beach was noted, Dr Hashimoto stated that same would need to be investigated.

5.3 Coastal Conservation Plan at Bel Ombre

- (a) Dr Hashimoto stated the following :
 - (i) The Bel Ombre sediment cell is accreting in total with localized erosion opposite hotel Heritage Awali in front of hotel.
 - (ii) Erosion is being caused by the presence of hard structures within the beach dynamic zone, for instance the vertical impermeable retaining wall of the restaurant of Heritage Awali hotel.
 - (iii) The main rehabilitation measures would be adherence to setback policy, removal and/or improvement of structures in front of hotel sites and coral reef conservation plan.
- (b) Referring to the comments of Dr Hashimoto that changes at Bel Ombre have been observed since the year 1992 due to hotel developments, the Chairman pointed out hotel developments in the Bel Ombre area started as from the year 2002 and onwards.
- (c) Accordingly, the Chairman stressed that we need to explain the changes noted.
- (d) Dr Hashimoto informed that the changes noted in the year 1992 could have been due to cyclones and further investigations would be carried out.

5.4 Coastal Conservation Plan at Le Morne

- (a) Dr Hashimoto stated the following:
 - (i) Long term study on shoreline changes showed that the site is almost accreting. There are signs of erosion on the north and south parts.
 - (ii) Erosion is being caused by the presence of hard structures within the beach dynamic zone, for instance, the groyne in front of Dinarobin Hotel. Additionally, it has been observed that the beach was stable at areas where there were coral and seagrass patches within the lagoon.
 - (iii) Rehabilitation measures would be adherence to setback policy, coral and seagrass conservation and management of lagoonal activities such as kite surfing, fishing amongst others.
- (b) The Chairman inquired in relation to the growth of seagrass and algae within the lagoon and Dr Hashimoto stated that one possible explanation could be nutrient inputs within the lagoon.
- (c) The Chairman pointed out that this was an interesting scenario whereby nutrient inputs in the lagoon was leading to the growth of seaweeds /seagrasses and the latters were contributing towards the stabilization of the beach.
- (d) Dr. Hashimoto explained that plantation of seagrasses and corals could be long term alternatives for stabilization of the coasts. However, impact of lagoonal activities, such as fishing, on these ecosystems would need to be controlled.

5.5 Coastal Conservation Plan for Flic en Flac

- (a) Dr Hashimoto stated the following :
 - (i) Analysis of aerial photos since 1967 showed that the sediment cell is accreting in total with localized erosion near to Pearle Beach hotel.
 - (ii) One of the possible causes for erosion in front of the public beach could be due to previous sand and coral mining activities within the lagoon.
 - (iii) As a short term measure, sandbypass may be carried out from Villas Caroline to the eroded areas. In the long term coral transplant and seagrass plantation could be envisaged.
- (b) The Chairman inquired on the impact of the major pass that exists in front of Pearle beach hotel on the public beach. Accordingly, Dr Hashimoto stated that the physical effects of the pass would need to be investigated.
- (c) Dr Hashimoto added that an estimated volume of 2000 m³ sand sediment is loss offshore through the pass every year and the sediment dynamics of the lagoon would need to be investigated in order to be able to estimate the amount of sand that could be recollected.

- (d) The representative of Mauritius Oceanography Institute (MOI) informed that surveys have been carried out by his Institution in relation to offshore sand deposits at Flic en Flac. However the surveys have been undertaken some 200 m from the coast line and survey further offshore may be required for a better assessment

5.6 Coastal Conservation Plan for Baie du Tombeau

- (a) Dr Hashimoto explained the following :
 - (i) Analysis of aerial photos since 1967 showed that on the overall the site is accreting.
 - (ii) The main causes of erosion were change in wave condition during cyclones and presence of boundary walls within the beach dynamic zones.
 - (iii) Rehabilitation measures would include adherence to setback policy, removal/improvement of hard structures within the beach dynamic zone and coral /seagrass conservation plans.
- (b) Referring to satellite images of Albion, Trou aux Biches and Mon Choisy coastal stretches, Dr Hashimoto reiterated the importance of seagrasses and corals for stabilization of the coast.

5.7 Reef Conservation Plan

- (a) Dr Hashimoto explained that there was a need to establish an inventory of corals, seagrass and mangroves for future use. He pointed out there were inadequate data of past corals, seagrass and mangroves distribution.
- (b) The Chairman informed that CASI imagery was taken in the year 1994 and same could be a useful database for coral distribution within the lagoon.
- (c) Mrs. N. Soogun reported that the imagery was available at the level of the Ministry of Fisheries and a copy of same has already been provided to the JICA team.
- (d) Dr Hashimoto pointed out that the MOI has carried out mapping of the South East coast and data on coral, seagrass and mangrove distribution in the South East coast was available. He added that the oil spill sensitivity atlas was also useful, however same would need to updated.
- (e) The Chairman requested the JICA team to take into account the changes of the reef passes over years within the proposed reef conservation plan.
- (f) Dr Hashimoto also apprised that coral transplantation within the lagoon was being undertaken in an experimental scale by the relevant authorities and proposal would be made for large scale coral transplant after discussion with the Ministry of Fisheries and MOI.
- (g) The Chairman asked the JICA team to come up with a road map for implementation reef conservation measures.

5.8 Monitoring of lagoon and coast

- (a) Dr Hashimoto explained that aerial photos and satellite images are important tools to monitor spatial changes in the lagoon and coastline. However, the resolution of the satellite images should be taken into consideration.
- (b) Further to an inquiry from Mr Seenauth in relation to availability of satellite images under the Monitoring for Environment and Security in Africa (MESA) Programme, the representative of MOI stated that the project has just started and they were at the stage of data collection from all the relevant authorities.
- (c) The representative of Mauritius Meteorological Services (MMS), reported that the satellite photos available at their level were coarse images.
- (d) Dr Hashimoto informed that satellite photos from Google Earth were useful for monitoring of coral reef, seagrasses amongst others. Additionally, aerial photos and site surveys could be carried out on a regular basis for better accuracy.
- (e) It was also taken note that beach profile survey was very important to understand beach changes especially after cyclonic conditions and storm surges.
- (f) Mr. R. Beedassy informed that for post EIA/PER monitoring purposes, we request proponents to carry out beach profile survey before and after implementation of the project. However, there was a need to establish a common protocol for beach profile survey in order to ensure better comparison of results.

5.9 Extension of Flexible Revetment at Grand Sable

- (a) Dr Hashimoto informed that further to request from the MOESD to extend the flexible revetment in front of Grand Sable public beach, the JICA Team is preparing the designs with costs and same would be submitted to the MOESD for consideration.
- (b) The Chairman requested the JICA team to proposed measures for storm water drainage and Dr Hashimoto stated that same would be considered within the design.

5.10 EIA Guideline for coastal protection

- (a) Dr Hashimoto informed that the JICA team would propose improvement of existing guideline and checklists on coastal developments available at the level of the Ministry of Environment and Sustainable Development, taking into consideration past EIA projects, climate change impacts.

5.11 GIS Training

- (a) Dr Hashimoto informed that 2 days training (7th and 9th July 2014) on use of ArcGIS and QGIS for analysis of shoreline change and sediment budget were held with the relevant stakeholders.

- (b) Further to query from the Chairman on the difference between Arc GIS and QGIS, Dr Hashimoto stated that QGIS is open source software available freely through internet and same could be easily installed.

5.12 Progress Report 2

- (a) Dr Hashimoto reported that in line with the delivery of the project, the second progress report has been prepared and the views of the stakeholders would be important to finalize same.
- (b) Mr Seenauth informed that a soft copy of the report had been circulated to all the stakeholders for views by mid-August 2014 and same would be compiled and submitted to the JICA team by end of August 2014.
- (c) The Chairman made the following comments on the report:
- The introduction section elaborated a lot on climate change. However, same should be broadened from the coastal zone perspective.
 - The facts and figures need to be reviewed and updated.
 - Maps used in the document should be from official sources and should include cover the Territory of the Republic of Mauritius to include Tromelin and Diego Garcia.
 - The report should include a concise and comprehensive executive summary.
 - The use of terms should be clear, for instance, distinction between the decrease of percentage live coral within the lagoon and the reef area.
- (d) In relation to wave data, the Chairman iterated the importance to understand wave characteristics within the reef passes in order to better understand the impacts on the coast.
- (e) Accordingly, Dr Hashimoto explained that there was a need for basic data, for instance, shape of passes and further investigation was required.
- (f) The Chairman advised the stakeholders to comment on the report in order to ensure that their institutions/authorities have been taken on board.
- (g) Mr. Seenauth requested the JICA team to have a separate document with all the information for each site selected for development costal conservation plan.
- (h) The Chairman advised that the document for each site should be well structured to include the situational analysis, action plan and implementation plan.

5.13 Other issues

- (a) Mr. Seenauth requested the opinion of Dr Hashimoto in relation to a proposal from the Beach Authority to put geobags covered with sand as an immediate measure to control beach erosion at Mon Choisy public beach.

- (b) Dr Hashimoto stated that, as per his experiences from Japan, geobags are prone to vandalism. However if the geobags are covered, the risk would be reduced and continuous monitoring would be required.
- (c) In relation to wave hunters and current meters acquired under the project, Dr Hashimoto advised that the equipment could be handed over to the MOI and MMS as appropriate institutions for collection of wave data.

6.0 Closing

- The Chairman thanked the members present.
- The meeting ended at 12 00 hrs.

**MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT
CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND
REHABILITATION IN THE REPUBLIC OF MAURITIUS
(JICA PROJECT)**

Notes of Meeting of 13th Technical Committee held on Wednesday 15th October 2014 at 10 00 hours in the Conference Room, 3rd Floor, Ken Lee Tower, Barracks St Port Louis

Chairperson: Mr. K. Heeramun, Ag. Deputy Director Ministry of Environment and Sustainable Development (MOESD)

Were present:

Mr. Y Pathel	Divisional Environment Officer (DEO), MOESD
Mr. J Mosaheb	Principal Research Scientist, Mauritius Oceanography Institute
Mr. R Juggoo	Development Control Officer, Ministry of Housing and Lands
Mrs. N Roomaldawo	Technical Officer , Ministry of Fisheries
Mr. D Cyparsade	Enforcement Officer, Ministry of Local Government
Mrs. C Cyparsade	Assistant Conservator of Forests, Forestry Service
Mrs. S Sauba	Technical Officer, National Parks and Conservation Service
Mr. H Cauleechurn	Inspector of Police , National Coast Guard
Mr. R Virasami	Meteorologist, Meteorological Services
Dr R Ramessur	Associate Professor, University of Mauritius
Dr R Bhagooli	Senior Lecturer, University of Mauritius
Mr. S Zeadally	Senior Hydrological Officer, Water Resources Unit
Mrs. A Ghoorah	Environment Officer (EO), MOESD
Mrs. N Soogun	EO, MOESD
Ms. H Ramdour	EO, MOESD
Mrs. I Auliar	EO, MOESD
Mrs. S D Jowahir	EO, MOESD
Ms. Sannassy Pilly S	STM Intern, MOESD
Mr. A. Jheengut	EO, MOESD (Secretary)

Japan International Cooperation Agency (JICA)

Name	Designation
Mr. S Onaka	JICA Expert Team
Dr S Nojima	JICA Expert Team
Mr. S Endo	JICA Expert Team
Mr. S Ichikawa	JICA Expert Team
Ms S Mungroo	JICA Expert Team
Mr. N Sumodhee	JICA Expert Team

1.0 Opening of the meeting

- 1.1 Mr. K. Heeramun welcomed all members present and specifically thanked the representatives of the JICA team for their presence.
- 1.2 He informed that the main purpose of this Technical Committee for the JICA Project was to apprise the members on the comments obtained on Progress Report 2, to discuss the demonstration projects and proposals for technical guidelines.

2.0 Approval of Notes of Meeting

- 2.1 The notes of meeting of the 12th Technical Committee held on the 31 July 2014 were read and approved with the following amendment:

Page 4 section 4.2.1 (c) - 'Environment Impact Assessment' to be read 'Environmental Impact Assessment'. The Chairman pointed out that according to the glossary as well as abbreviations and acronyms, EIA stands for 'Environmental Impact Assessment'

3.0 Matter Arising

- 3.1 In relation to availability of aerial photographs under 'the hunting survey aerial photography project in 1965' carried out by the Ministry of Housing and Lands (MHL), the representative of latter Ministry stated that he will enquire on same and inform this Ministry accordingly.

4.0 Presentation by JICA

4.1 Mr. S. Onaka thanked all members for their presence and collaboration. The main issues discussed were as follows (copy of the presentation is at **annex 1**):

- (a) Comments/views received on Progress Report 2;
- (b) Policy and principle of development of coastal development plans;
- (c) Status of demonstration project at Grand Sable and Pointe d'Esny and
- (d) Proposed contents of Technical Guidelines (beach monitoring, coral reef monitoring, Environmental Impact Assessment of coastal conservation project)

5.0 Main Issues

5.1 Comments/views on Progress Report 2

5.1.1 The Chairman informed that the Progress Report 2 was presented and discussed during the 12th Technical Committee held on 31st July 2014 and all the stakeholders were requested to submit their comments by mid August 2014. He invited Mr. A. Jheengut to provide an overview of the comments received for the benefit of the members present and to ensure that the comments are properly understood and addressed in the report.

5.1.2 Mr. Jheengut reported the following:

- (a) Views were received from 12 institutions (Mauritius Oceanography Institute, District Council of Riviere du Rempart, District Council of Black River, National Coast Guard, Mauritius Meteorological Services, Wastewater Management Authority, Water Resources Unit, University of Mauritius, Ministry of Housing and Lands, Ministry of Agro-industry and Food Security, Beach Authority and Ministry of Fisheries). Same were submitted to the JICA team for their consideration.
- (b) All the stakeholders were in principle agreeable to the contents of the report and the following were highlighted, amongst others:
 - (i) **Mauritius Oceanography Institute**: to include and update figures relating to accumulated sand found off reefs at Flic en Flac;
 - (ii) **University of Mauritius**: to have a more scientific approach for instance on the methods used for water quality tests and have a critical assessment of the current coastal protection measures implemented around the Island.
 - (iii) **Beach Authority**: to provide guidelines on beach maintenance after implementation of any proposed measures.

(iv) **Integrated Coastal Zone Management Division (ICZM):**

- the data, figures provided would need to be updated in light of the latest statistical figures available;
- the necessity to have separate reports for each sites selected for formulation of coastal conservation plan;
- the data that was used for coastal planning has to be included in each site report. It will include on-going data as well as beach profile monitoring, wave and current measurement, and lessee's input on the draft CCP of Pte. d'Esny;
- detailed plans and specification to be provided for any structures proposed;
- An executive summary to be included;
- To indicate any need for additional surveys as well as the parameters to be monitored/measured; and
- All recommendations to be supported by scientific data/evidence.

5.1.3 Mr. S. Onaka confirmed that the JICA team has taken all the comments on board.

5.1.4 The Chairman stressed that the comments made during the 12th Technical Committee held on 31st July 2014 as reflected in the notes of meeting were also pertinent and should be considered.

5.1.5 Upon a proposal from the Chairman, the Committee agreed that a small editing team would need to be set up comprising the main stakeholders to look into the final draft report expected by February/March 2015.

5.2 Policy and principles for development of coastal conservation plans

5.2.1 Mr. Onaka informed that the measures being proposed in the coastal conservation plans take into account the beach use, the natural environment, the type of beach (sandy beaches with no structures, sandy beach with existing structures), the sediment budget (accumulating or eroding).

5.2.2 The Chairman drew the attention that on several occasions the term 'structures' were mentioned and the type of structures to be implemented was not clear. Accordingly, he requested the JICA team to clearly mention the type of structures proposed.

5.3 Demonstration Project at Grand Sable

5.3.1 Mr Onaka informed the following :

- (a) Since the completion of the works in December 2013, regular monitoring has been carried out and the results indicate that the beach is stable. Improvement has been noted in the beach use, recreational activities, natural environment and water quality;
- (b) Several consultative meetings have been carried out (latest one was carried out on 7 October 2014) with the inhabitants of Grand Sable on the importance of maintenance and beach control; and
- (c) A questionnaire survey was undertaken with the inhabitants and the results indicate an increase in beach use and acceptance of the project by the inhabitants.

5.4 Demonstration Project at Pointe d'Esny

5.4.1 Mr. Onaka reported the following:

- (a) Several consultative meetings were held with the lessees of Pointe D'Esny (latest one was held on Thursday 9 October 2014) to discuss on the measures proposed at Pointe d'Esny;
- (b) Some of the lessees were not agreeable to sand bypass from naturally accumulated areas in front of bungalow sites. Other lessees were not agreeable to set back measures; and
- (c) Accordingly, amendments would be made to the coastal conservation plan proposed taking into account the views of the lessees.

5.4.2 In relation to availability of sand sediment source for beach nourishment at Pointe d'Esny, Mr. S. Onaka informed that the lessees were of the opinion that sand is naturally accumulating in the lagoon in front of Ile aux Aigrettes islets and same could be used for beach nourishment. However there was a need for further investigations.

5.4.3 Mrs. N. Soogun drew the attention of the JICA team that removal of sand from the lagoon has been banned since 2001 and accordingly, there would be a need to find for alternative sources, for instance offshore.

5.4.4 The Chairman stated that there were different schools of thoughts as regards the removal of sand from the lagoon. The objective of the ban was to stop the exploitation of sand for commercial purposes and to redress the harm caused from an environmental and ecosystem perspective. The impacts of any transfer of sand from the area will require further investigation and close monitoring.

5.5 Technical guidelines

- 5.5.1 The proposed chapters/topics/checklist to be included within the technical guidelines on coral reef monitoring, EIA, beach monitoring and coastal conservation plan were discussed and agreed upon.
- 5.5.2 The members were informed that they could still forward their comments on the Progress Report 2 and the Technical Guidelines.

6.0 Closing of the meeting

- 6.1 The Chairman thanked the JICA Expert Team for the presentation and the members for collaboration.
- 6.2 The meeting ended at 12 00 hrs.

MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND REHABILITATION IN THE REPUBLIC OF MAURITIUS (JICA PROJECT)

Notes of 1st Meeting of Steering Committee held on Monday 28 May 2012 at 09:30 hours in the Conference Room, 3rd Floor, Ken Lee Tower

Chairperson: **Mr. P Jhugroo, Permanent Secretary Ministry of Environment and Sustainable Development (MOESD)**

Present:

Name	Designation/Organisation
Mrs D L Ng	Director of Environment, MOESD
Mr P Kallee	Deputy Director of Environment, MOESD
Mr J Peeroo	Principal Assistant Secretary, MOESD
Mr S Seewoobaduth	Divisional Environment Officer, MOESD
Mr R Beedassy	Divisional Environment Officer, MOESD
Mr R Seenauth	Divisional Environment Officer, MOESD
Mrs M Hurbungs	Divisional Scientific Officer, Ministry of Fisheries
Mr D Jhuboo	Principal Engineer, Ministry of Public Infrastructure, NDU, LT&S
Mr BMD Kurreemun	Assistant Secretary, MOESD
Mr N Mungroo	Senior Financial Analyst, Ministry of Finance &ED
Mr N Khedah	Technical Manager, Beach Authority
Dr R Bhagooli	Senior Lecturer, University of Mauritius
Mr S Zeadally	Senior Hydrological Officer, Water Resources Unit
Ms C P Aubeeluck	Tourism Planner, Ministry of Tourism & Leisure

Name	Designation/Organisation
Dr D Bissessur	Research Scientist, Mauritius Oceanography Institute
Mr J Mosaheb	Research Scientist, Mauritius Oceanography Institute
Mr H B Naujeer	Research Development Officer, National Parks & CS
Mr L Magho	Environment Officer, MOESD
Mrs N Soogun	Environment Officer, MOESD
Mr S Buskalawa	Environment Officer, MOESD
Mr A Jheengut	Environment Officer, MOESD
Mr R Luximon	Environment Officer, MOESD
Ms H Ramdour	Environment Officer, MOESD
Mr AK Dhoomun	Environment Enforcement Assistant, MOESD
Mr H Cauleechurn	Inspector, National Coast Guard
Mrs. G Rosunee	Principal Planner, Ministry of Housing and Lands

Japan International Cooperation Agency (JICA)

Name	Designation
Mr. K. Ichikawa	Chief Advisor, JICA Expert Team
Mr. H. Hashimoto	Chief Vice Advisor, JICA Expert Team
Ms. M. Tsukizoe	Deputy Assistant Director, JICA H and Disaster Management Division
Mr. J. Kawase	Project Formulation Advisor, JICA, Madagascar
Mrs. M.Razafimahefa	Program Officer, JICA Madagascar
Ms. M. Citon	Project Assistant, JICA Expert Team

Absent with apology: Mauritius Meteorological Services

1. Opening of the meeting

- 1.1. The Chairman welcomed all members present and specifically thanked the representative of the JICA Team for their assistance. Members were informed that the purpose of this first Steering Committee meeting was to provide an overview

of the project on “*Capacity Development on Coastal Protection and Rehabilitation in the Republic of Mauritius*” which was being funded by the Japan International Cooperation Agency (JICA) and same was being implemented by the Ministry of Environment and Sustainable Development (MoESD).

- 1.2. The Chairperson expressed the wish that all stakeholders concerned would provide the required support, through the Steering Committee, to the JICA Team for the successful implementation of the project which was of national importance.
- 1.3. Mr. Beedassy and the representatives of the JICA Expert team were then invited to present the project to members.

2. Presentation of the Project

2.1 Mr. Beedassy made a presentation on the followings:

(I) Coastal Projects Addressing Coastal Erosion

(a) **The Project for Capacity Development on Coastal Protection and Rehabilitation in the Republic of Mauritius** (Project)

- **Main objectives**

- To identify affected coastal sites and accordingly select priority sites to implement coastal and rehabilitation measures based on coastal conservation plans.
- To carry out demonstration projects at a few selected sites.
- Capacity development on coastal protection and rehabilitation to stakeholders.

Supporting/Funding Agency:

JICA

Implementing Agency:

Ministry of Environment &
Sustainable Development

Duration:

3 years as from June 2012

(b) **Coastal Protection Works under Program Based Budget (PBB)**

- **Nine Sites earmarked for Coastal Protection Works for Period 2012-2015 : namely ,**

Bain Boeuf , Cap Malheureux, Poudre D’Or, Grand River South East , Quatre Soeurs, Rivière Noire/ La Preneuse , La Prairie, Morne Village and Baie du Cap.

- **Status**

- Consultant GIBB (Mauritius) Ltd recruited to carry out survey, prepare design and tender document and monitor works on site.
- Site visits have been effected at the sites by the Consultant.
- Awaiting Inception Report prior to submission of Preliminary Designs

(c) **Africa Adaptation Programme (AAP)**

- **Main Objective**

To integrate and mainstream climate change adaptation into the institutional framework and into core development policy, strategies and plans for the Republic of Mauritius (Mauritius, Rodrigues and Agalega)

- Funded by Government of Japan (GOJ).
- Mauritius is one of the 20 participating countries and has received US\$3 million.
- **Key Sectors Involved:** Environment (including public infrastructures, health and land planning), Agriculture, Fisheries, Tourism, Water, Education & Finance and Disaster Risk Reduction.

(d) **Adaptation Fund Board (AFB) Climate Change Adaptation Programme in the Coastal Zone of Mauritius**

- **Main Objectives**

- Application of adaptation measures for coastal protection at Mon Choisy, Rivière des Galets and Quatre Soeurs
- Development and implementation of early warning system for incoming storm surge
- Capacity building
- Policy mainstreaming on climate change
- Knowledge dissemination on climate change effects in the coastal zone.

- **Supporting/Funding Agency:** Adaptation Fund Board under Kyoto Protocol

- **Implementing Agency:** Ministry of Environment & Sustainable Development

- **Duration:** 5 years

- **Status**

- Recruitment of Project Manager ongoing
- Draft Terms of Reference for Project Assistant prepared
- A meeting of the Local Project Appraisal Committee (LPAC) held to introduce project to stakeholders and secure their collaboration

(II) Roles and Responsibilities of Stakeholders for the JICA Project

The roles and responsibilities of all the concerned stakeholders for the JICA Project were outlined.

2.2 Mr. Ichikawa and Dr. Hashimoto from the JICA Expert team presented the Inception report, which detailed the background, the goals and objectives and the expected outcomes of the JICA Project. They emphasized on the need for data and

collaboration of all stakeholders for the successful implementation of the project.

The main components of the Project are:

- to undertake baseline survey to identify affected sites;
- to formulate coastal conservation plans for the main Island of the Republic of Mauritius;
- to implement demonstration projects to validate the effectiveness of those projects; and
- to disseminate technical knowledge and also capacity building to ensure the sustainability of the project.

3.0 Main issues raised

- 3.1 The Chairman reiterated that the commitment of the key stakeholders was imperative for the successful implementation of the project. Their professional and technical inputs were of vital importance all throughout the duration of the Project. He added that it was a unique opportunity for all officers concerned to learn and benefit from the expertise, wide knowledge and experience of experts from JICA who would be in Mauritius at different stages to help implement the Project.
- 3.2 The representative of the Ministry of Public Infrastructure, NDU, LT & S thanked the members of the JICA team for their full support in the implementation of various ongoing as well as previous projects. He requested whether consideration could also be given for capacity building in the Engineering field in relation with coastal protection works.
- 3.3 The representative of Ministry of Tourism and Leisure focused on the importance of the lagoon and beaches for tourism activities and proposed that any structures that would have to be put along the coasts should be in harmony with the beaches. The Chief Advisor of the JICA Technical Team gave assurance that this aspect would be looked into very closely.
- 3.4 The representative of Ministry of Fisheries informed members about the availability of long term data on coral reef monitoring at the Albion Fisheries

Research Centre (AFRC) and also about the establishment of coral farms at various locations around the Island under the AAP.

- 3.5 The representative of Beach Authority pointed out the need to adopt a holistic approach when considering recommendations for structural interventions at affected sites, so as to minimize impacts on adjacent coastal areas. He also referred to his recent study tour relating to coral transplants being undertaken in Australia to minimize coastal erosion. Mauritius would have a lot to gain from the experiences of Australia.
- 3.6 The representative of the University of Mauritius reported about the state of coral reef in the Flic en Flac region and wished that any recommendations for structural intervention in that region should not affect the live corals.
- 3.7 The representative of the Mauritius Oceanography Institute informed members about the availability of data at their level. He also requested that the MOI be taken on board for capacity building programmes.
- 3.8 The representatives of the different organisations agreed to provide full support and collaboration in the implementation of the project.
- 3.9 Mr. Seewoobaduth of the MoESD emphasised on the importance for training and capacity building so as to ensure the future sustainability of the project.
- 3.10 The Chairperson expressed his appreciation on the availability of most of the data and stated that capacity building of all the stakeholders was a key component of the project. He added that the implementation of the project would lead to the development of a master plan which would include formulation of countermeasures to address coastal erosion in Mauritius. He stated that the collaboration of the Ministry of Finance and Economic Development in terms of funding during the implementation of the Master Plan would be vital.
- 3.11 The Representatives of the JICA expert team also expressed their appreciation on the readiness of the relevant stakeholders to provide their full support and collaboration to the project. They added that their team would also provide their help, as far as possible, in other coastal protection projects being undertaken by the MoESD.

3.12 Following discussions, it was agreed that:

- initially, the Steering Committee would meet on a monthly basis to ensure a good start of the project;
- technical committees would be set up and would meet on a more regular basis;
- the JICA Technical Team would be invited to the Steering Committee meetings on the other coastal protection projects which were being undertaken by the MoESD; and
- a soft copy of the presentations would be circulated to all the members of the Steering Committee.

4.0 The Chairman thanked the members present. The meeting ended at 11 00 hrs.

12 June 2012

MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

**CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND REHABILITATION IN
THE REPUBLIC OF MAURITIUS
(JICA PROJECT)**

**Notes of 2nd Meeting of Steering Committee held on Tuesday 4th June 2013 at
13:00 hours in the Conference Room, 3rd Floor, Ken Lee Tower**

Chairperson: **Mr. P Jhugroo, Permanent Secretary Ministry of Environment and Sustainable Development (MOESD)**

Present:

Name	Designation/Organisation
Mrs D L Ng	Director of Environment, MOESD
Mr J Peeroo	Deputy Permanent Secretary, MOESD
Mr P Kallee	Deputy Director of Environment, MOESD
Mr S Mooloo	Deputy Director , MOESD
Mr R Seenauth	Divisional Environment Officer, MOESD
Mrs D Rajkoomar	Divisional Environment officer , MOESD
Mr M Jeelall	Project Manager , MOESD
Mr BMD Kurreemun	Assistant Permanent Secretary, MOESD
Mr L Magho	Environment Officer, MOESD
Mr A Jheengut	Environment Officer, MOESD
Ms H Ramdour	Environment Officer, MOESD
Mr A Dhoomun	Environment Enforcement Officer , MOESD
Mr B Ramcharun	Divisional Scientific Officer, Ministry of Fisheries
Mr D Jhuboo	Principal Engineer, Ministry of Public Infrastructure, NDU, LT&S
Mrs C Green Jokhoo	Principal State Counsel , AGO
Mr S Permala	Head Public Infrastructure Department , District Council of Grand Port
Mr P Balloo	Head Public Infrastructure Department , District Council of Black River
Dr R Ramessur	Associate Professor , University of Mauritius
Mr B M Heetun	Divisional Meteorologist , Meteorological Services
S K Seechurn	Civil Engineer , District Council of Savanne

Name	Designation/Organisation
Mr H Gopaul	Engineer, Wastewater Management Authority
Mr G Servansingh	Technical Officer , Beach Authority
Mr H Cauleechurn	Inspector, National Coast Guard
Mr S Zeadally	Senior Hydrological Officer, Water Resources Unit
Mr J Mosaheb	Research Scientist, Mauritius Oceanography Institute
Mr S Ramessur	Trainee
Mr P Juddoo	Service to Mauritius
Mrs N Soogun	Environment Officer, MOESD (Secretary)

Japan International Cooperation Agency (JICA)

Name	Designation
Mr. H. Hashimoto	Chief Vice Advisor, JICA Expert Team
Mr. S. Onaka	JICA Expert Team
Mr. S. Ichikawa	JICA Expert Team
Mr T. Kurata	JICA Expert Team
Ms H. Yoshida	JICA Expert Team

Absent :

1. Ministry of Local Government and Outer Islands
2. Ministry of Housing and Lands
3. Ministry of Tourism and Leisure
4. Ministry of Agro-Industry and Food Security
5. Ministry of Energy and Public Utilities
6. Ministry of Finance and Economic Development
7. Central Water Authority
8. Pamplemousses District Council , Rivière du Rempart District Council , Flacq District Council

1.0 Opening of the meeting

- 1.1 The Chairman welcomed all members present and specifically the representatives of the JICA Team. He said that the second meeting was being held after some time due to time taken to complete the first progress Report under the project.

2.0 Approval of the Notes of meeting held on the 28th May 2013

2.1 The Notes of meeting held on the 28th May 2013 were read and approved without any amendment.

3.0 Presentation of the Progress Report

3.1 The Chairman then invited Dr Hashimoto to make a presentation on the Progress Report

3.2 Dr Hashimoto gave a brief description of the contents of the Progress Report and the findings of the preliminary surveys undertaken under the project since June 2012. (Copy of the presentation is at Annex 1). The main points were as follows:

(i) Progress and schedule

- Activities under Component 1 of the project had been completed, namely; data collection, long term shoreline analysis, data analysis, identification of existing conditions, and database construction.
- Activities under Component 2 had been started, namely; the identification of potential sites for the development of coastal conservation plans. He said that out of 58 sites initially surveyed, the coast was divided into 13 sediment cells, out of which 12 coasts had been selected for coastal conservation plans.

(ii) Summary of the findings from the basic study

- Long term changes showed that about 11% of beaches around Mauritius were eroded, 30% accreted and 59% were stable.
- The following three coasts , namely : Albion, Bel Ombre and Mon Choisy showed erosive patterns, and the most significant beach erosion was identified at Albion (-0.5m/year)
- The coverage of live coral was found to be 27 % at 37 sites. The results for long-term survey conducted by AFRC showed that the coverage of living coral decreased from 50 % in 2000 to 20 % in 2010.
- Among 8 sites where water quality surveys were carried out, 6 sites were identified where the levels of turbidity and chlorophyll were high. The site with the highest turbidity and chlorophyll level was Pointe aux Sable.
- Foreshore slope at coral reef beaches was between 1/8 to 1/10, and the mean grain size was 0.3mm to 0.8mm.
- Two Wave Hunters and two Current Meters had been placed in the lagoon of Pte D'Esny to collect information on the current and wave patterns in this area.

(iii) Selection of study area

- 12 coasts had been preselected for development of coastal conservation plans. Two sites would be selected for implementation of demonstration projects and 5 sites for monitoring purposes.
- The two demonstration project site would comprise one where physical intervention (PI) would be carried out and one where there would be no physical intervention (NPI).
- The criteria for selection of a specific site would include natural and environmental conditions, obstacles to land use, importance for protection of hinter area, validity for future development plan, and national policy among others.
- Among the 12 preselected sites for beach conservation plan, Grand Sable was proposed for the PI site and Pte D'Esny for the NPI. Based on the discussion at the Technical Committee, it was highlighted that there was need to take action for Grand Sable as the coastal road was being eroded by wave action, the coastal village was at risk, there was presence of a bus-stop which was nearly collapsing due to erosion of the shore, and also taking into consideration security aspects of users and request from the villagers for protection measures. The escarpment produced by erosion at that site was around 1.5 to 2 m, which was higher than at other sites. Moreover, Grand Sable was an example of the east coast of the island where similar situations exist for over 12 km. If the protection measures would work out at Grand Sable, same could be replicated at the other sites in the area. That was why Grand Sable was proposed.
- Most of the area at Pte D'Esny comprised sites that were leased and basically each lease owner should take care of the conservation of the beach. However, comprehensive beach conservation was required at Pte D'Esny taking into account the mechanism of littoral drift. Also based on the proposed beach conservation measures, consensus building would be very important not only on the public side (lease owners) but also on the government side. Also, there are other coasts that would require a similar approach (ex. La Preneuse, Flic en Flac, etc.). That is why Pte D'Esny was proposed as NPI.
- The five monitoring sites were chosen taking into account present and future concerns on coastal erosion.

(iv) Coastal Conservation Plan (CCP)

- 12 sites had been chosen for development of CCP.

- Meetings would be held as from 7th June 2013 to discuss on each CCP.

(v) Capacity building

- A Seminar to disseminate the progress Report would be held on the 17th June 2013.
- A workshop would be held on the 28th June 2013 to discuss on the Coastal Conservation Plans
- A Technology Exchange programme would be held between Mauritius and Seychelles in July 2013
- Training for officers would be held in Japan in December 2013
- Hands on training would be held on beach monitoring , GIS application amongst others

4.0 Outcome of the Technical Committee held on the 31st May 2013

- 4.1 The Chair said that the study has taken some time; however, a high quality report has been produced. A Technical Committee was held on the 31st May 2013 to discuss on the Progress Report and he then requested Mr Seenauth to report on same.
- 4.2 Mr Seenauth reported that the Progress Report was endorsed by the Technical Committee and it was also proposed to add two sites for the CCP namely Baie du Tombeau and Bras D'Eau, to which the JET agreed. The proposal of Grand Sable for the PI site and Pte D'Esny for the NPI site was also agreed upon.

5.0 Issues raised

- 5.1 To a query of Mr Peeroo on whether the 58 sites were only public sites, Dr Hashimoto replied that it included public and leased sites.
- 5.2 Mr Mooloo queried where sand would be obtained for beach nourishment. Dr Hashimoto replied that generally the beaches are accreting and at some places sand is being lost. During normal conditions the sand was accumulating outside passes. This sand could be used. However, detailed study need to be carried out. In Seychelles, sand was being dredged from the sea at 30 m depth.
- 5.3 Mr Mosaheb from MOI stated that studies were being carried out by MOI on accumulation of sand outside passes. A first report had been prepared for Flic en Flac and a second study was being carried out for Trou aux Biches and Mon Choisy.
- 5.4 Mr Ramcharun from the Ministry of Fisheries informed that in the context of the dredging for boat passage at the Fisheries Training Centre, sand would be available and could be used for beach reprofiling.

- 5.5 The Chair requested Dr Hashimoto to comment on the status of corals. He said that the corals were degrading due to an increase in the sea surface temperature and pollution. A coral reef conservation plan would be developed which would include water quality. It should be noted that corals require clear waters. The standards for lagoon water quality would be relooked at and the sources of nutrients need to be identified.
- 5.6 The Chair welcomed the idea for preparing a coral reef conservation plan and said that there was need to pull all available resources together to address the problem of coral degradation.
- 5.7 It was highlighted that the MOI and the Ministry of Fisheries were carrying out studies on coral farming. Similar studies had also been undertaken under the African Adaptation project.
- 5.8 Dr Hashimoto pointed out that as per the programme, the demonstration project would have to be completed by end of December 2013. He enquired on the need and time taken for EIA for the demonstration project. The Chair explained that procedures would have to be followed. However, the project would be put on fast track.

6.0 Validation of the progress Report

6.1 After discussions, the Progress Report was validated by members.

7.0 End of Meeting

7.1 The Chairman thanked the members present. The meeting ended at 1415 hrs.

15 July 2013

MINISTRY OF ENVIRONMENT AND SUSTAINABLE DEVELOPMENT
CAPACITY DEVELOPMENT ON COASTAL PROTECTION AND REHABILITATION
IN THE REPUBLIC OF MAURITIUS (JICA PROJECT)

**Notes of 3rd Meeting of Steering Committee held on Thursday 12th December 2013
at 13:00 hours in the Conference Room, 3rd Floor, Ken Lee Tower**

Chairperson: **Mr. P Jhugroo, Permanent Secretary Ministry of Environment and Sustainable Development (MOESD)**

Present:

Name	Designation
Mr P Kallee	Acting Director (MOESD)
Mr J Peeroo	Deputy Permanent Secretary, MOESD
Mrs C Green-Jokhoo	Principal State Counsel , Attorney General Office
Mr M Jeelall	Project Manager, MOESD
Mr R Seenauth	Divisional Environment Officer MOESD
Mrs D Rajkoomar	Divisional Environment Officer, MOESD
Mrs N Soogun	Environment Officer MOESD
Ms H Ramdour	Environment Officer MOESD
Mr B M D Kurreemun	Assistant Permanent Secretary, MOESD
Mr C N Paupiah	Senior Scientific Officer , Ministry of Fisheries
Mr HT Parsad	Hydrological Officer, Water Resources Unit
Mr O Gooroochurn	Associate Research Scientist, Mauritius Oceanography Institute
Mr H Caulteechurn	Inspector of Police , National Coast Guard
Mr P Balloo	Head Public Infrastructure Dept, Black River District Council
Mr A Reesaul	Head of Public Infrastructure Dept , District Council of Flacq
Mr I Auladin	Chief Inspector of Works, District Council of Grand Port
Mr N Langur	Chief Health Inspector , District Council of Riviere du Rempart
Ms S Sannassy Pilly	Service to Mauritius, MOESD

Japan International Cooperation Agency (JICA)

Name	Designation
Mr S Ichikawa	JICA Expert Team (Team Leader)
Mr S Onaka	JICA Expert Team
Ms S B Mungroo	JICA Expert Team

Absent representatives from:

1. Ministry of Local Government and Outer Islands
2. Ministry of Housing and Lands
3. Ministry of Tourism and Leisure
4. Ministry of Agro Industry and Food Security (NPCS)
5. Ministry of Energy and Public Utilities
6. Ministry of Public Infrastructure, National Development Unit, Land Transport and Shipping (MPI Division)
7. Ministry of Finance and Economic Development General Manager Beach Authority
8. University of Mauritius
9. Wastewater Management Authority
10. Central Water Authority
11. Savanne District Council
12. Pamplemousses District Council

1.0 OPENING OF MEETING

- 1.1 The Chairperson welcomed all members present.
- 1.2 The Notes of Meeting held on the 4th June 2013 were read and approved without any amendment.
- 1.3 The Chairperson reminded that at the last meeting, the Steering Committee was apprised of the first Progress Report of the JICA Expert Team. The Committee would now take cognizance of the updated Interim Report (ITR). He then invited Mr. Onaka to present the Report.

2.0 INTERIM REPORT

- 2.1 Mr. Onaka thanked the Chairperson and members present and made a presentation on the following:

(i) Outline of activities

- a) Demonstration projects
- b) Coastal conservation plans

(ii) Progress since last Progress Report

- a) Physical works for the Demonstration project at Grand Sable had started on 21st October 2013 and were expected to be completed by mid-December 2013.
- b) The preparation of the coastal conservation plans was ongoing.

- c) Monitoring of the beach profiles at the seven monitoring sites (Pointe D'Esny , Grand Sable, Ile aux Cerfs, Mon Choisy, Albion, Pointe aux Sable and Flic en Flac) had been started and would be maintained once every three months. A team had been set up comprising the MOESD/BA/MHL/MOI to undertake the monitoring exercise.
- d) At Grand Sable, the collaboration of the local residents would be sought for the monitoring of the beach profile for taking photographs at regular intervals. A team of 5 members had been set up under the leadership of the President of the Village Council to carry out the monitoring. In this respect, a training session would be organized on 17th Dec 2013 to guide the team how to carry out the monitoring and the taking of the photos. The photos would have to be taken on a weekly basis and the memory card (SD) from the camera would be collected by MOESD officers on a monthly basis.
- e) It had to be ensured that the pebbles were not removed from the beach. Beach maintenance at Grand Sable was very important for the success of the project which had to be undertaken by the Ministry of Local Government and the District Council of Grand Port
- f) The community would have to ensure that residents did not collect pebbles from the beach for personal use. They would have to carry out regular checks and prevent removal of the pebbles.
- g) A Beach cleaning event was carried out by residents on the 20th October 2013. The JET had proposed that such types of actions should be carried out again in 2014.
- h) The non physical demonstration project at Pointe D'Esny was ongoing.

2.2 Schedule for second stage

- a) Monitoring of beach profile would be continued
- b) The second Progress Report would be submitted by June 2014
- c) The Final Progress Report was expected in March 2015

3.0 REPORT FROM TECHNICAL COMMITTEE

3.1 The Chairperson informed members that the Technical Committee had met on 5th December 2013 and the ITR was presented and discussed. He then invited Mr. Kallee to give a brief on the discussion held.

3.2 Mr. Kallee reported that the ITR was presented to the Technical Committee. Members had been given up to the 31st December 2013 to submit their written

views/comments on the Report. He highlighted that the MOI had requested to ensure that there was no overlapping of responsibilities by authorities concerned in monitoring of beach profiles. It was thus agreed that sites like Mon Choisy and Flic en Flac would be monitored by the Monitoring Team set up under the JICA project. Mr. Kallee also stated that there was a request from the National Disaster Risk Reduction and Management Centre (NDRDMC) to provide updates on coastal protection works being carried out. He suggested that a representative from the (NDRDMC) could be invited to attend the SC, to which there was no objection.

3.3 It was also agreed that Members would have to submit their written comments on the ITR by the 31st December 2013.

4.0 MATTERS ARISING

4.1 Demonstration project at Grand Sable

4.1.1 Mr Kallee informed Members that the Hon Minister Moutia had expressed his appreciation to the JICA team for undertaking the demonstration project at Grand Sable. He suggested that a sign board be placed to inform the public about the demo project, to which the members agreed.

4.1.2 Mr. Seenauth said that a meeting was held the day before with the President of the Village Council of Grand Sable and the latter had made representations relating to the provision of parking space, footpath and handrails for security purposes.

4.1.3 Mr. Onaka stated that as a precautionary measure big rocks had been appropriately installed to prevent vehicles having access on the flexible revetment.

4.2 Coral Reefs Conservation Plan

4.2.1 The Chairperson pointed out that the problem of coral reef degradation was raised at the last meeting .As the situation was considered to be very serious, it was important to have a concerted approach to address the problem. He then requested representatives of the MOI and the Ministry of Fisheries to give a brief on what was being done at their level to prevent coral reef degradation.

4.2.2 Mr. Paupiah said that the monitoring of corals reefs by the Ministry of Fisheries had been ongoing since 1992. As regards actions taken by his Ministry, he would report thereon at a later stage.

4.2.3 Mr. Gooroochurn from the MOI stated that his organisation was carrying pilot studies at present on coral farming on land using seawater ponds whereas the Ministry of Fisheries was carrying the same type of studies in the lagoon.

- 4.2.4 Mrs Soogun highlighted that the ICZM Committee had constituted a Sub-Committee to ensure follow up on the management of coral reefs.
- 4.2.5 The Chairperson suggested that a meeting be held with the Ministry of Fisheries and the MOI to get more information on the actions that were being undertaken for the protection of coral reefs.
- 4.2.6 Mr Ichikawa pointed out that Dr Nojima, who was responsible for the development of a coral reef conservation plan under the JICA project would be back in Mauritius in March 2014. As such issues relating to coral management had to be sorted out and all relevant information submitted to the JET in the meantime.

5.0 CLOSING OF MEETING

- 5.1 Mr. Ichikawa said that so far the project had been implemented for some 20 months. He thanked the MOESD and the stakeholders concerned for their collaboration and support for the implementation of the project. He said that capacity building of the officers concerned had been successfully carried out so far and hoped for a more successful second phase of the project.
- 5.2 The Chair thanked JICA Team for their support and wished them as well as all members of the SC a Merry Christmas and a Happy New Year 2014.
- 5.3 The meeting ended at 15 30 hrs.

14. Seminar

The contents of this section are stored inside the hard disk which was handed from the JICA Expert Team to ICZM of MOESDDBM in this Project.