4. Existing Facility Survey


ASIA-PACIFIC SURVEYS

SURVEY REPORT – MANHOLE PICK UP

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Survey Report: Manhole Pickup

1. INTRODUCTION

This report outlines the activities undertaken from start to finish of this project.
This is a detail survey of selected manholes along various sewer lines for design purposes.

The main control points of this survey were done by Armen Larmer Surveys by which we (Asia Pacific Surveys) were told by JICA to use.
The survey was carried out by a GPS specialist and a graduate surveyor with a couple of experienced survey assistance.
The survey commenced on the 03/03/2011 and was officially completed on the 25/05/2011.

2. AIM

Aim: To carry out a detail survey of selected manholes and their levels for design purposes.

3. LOCALITY

The location of the project site is fairly along the shoreline which stretches from Kanudi to Kila Kila Police Barracks here in the Nations Capital.
See Appendix E for the location map.

4. FIELD PROCEDURES

The procedures include the identification of the selected manholes in their various locations through to the establishment of control points by GPS and the pick up of the manholes by total station.

4.1 Reconnaissance

A walk through the survey site was carried out where the selected manholes to be surveyed were identified.
Suitable existing control points were also chosen for our GPS Base stations during this process.
The locations of our GPS Remote/Rover stations were also marked in suitable open spaces but a fair distance to the selected manholes.

4.2 Control

The method of Static GPS was performed for this procedure where pick up stations were established from existing survey controls done by Arman Larmer Surveys.

This was carried out using Thales Z-max GPS for the Base stations and Thales Promark for the rover stations.
Two GPS base stations were setup on selected existing control points to establish our bench marks in various locations along the route of our survey. The observation time between rover stations were between fifteen to twenty minutes with the visibility of ten or more satellites.
The existing controls used for our base stations were PS119, PM003 and PSM2139, BM200. All our GPS points are represented by the initial SW.
These control points can be identified in the control coordinate listings.
See Appendix A.

4.3 Pick-up

The features picked up were mainly the top (ground level) and bottom levels (bottom of pit) of the manholes and their respective inlet and outlet pipes. These were surveyed using the Sokia Total station and a mobile target held perpendicular to the pick up surface.

Photos of each manholes showing their flow directions were also taken during this process.
See Appendix B.

4.4 Reductions/Plan preparation

All points surveyed were downloaded into CivilCAD 5.7 in day files and edited.
These individual jobs were then merged into one complete job representing the whole manhole surveyed in the project.
This merged job was then extracted into AutoCAD to show the positions and flow direction of the manholes. See Appendix F.

The CivilCAD data was also then extracted into a spread sheet showing the point numbers, their positions and levels. See Appendix C.
The manhole depths, distances and slope between two selected manholes were then computed in the spread sheet.
Sketches were finally done in the spread sheet to simplify the data.
See Appendix D.

A DXF and a DWG file was extracted from the CivilCAD data as an evidence of the job been done.

5. DATA

Data provided will include both hard and soft copies of the following:

I. A spread sheet containing a summary of manhole checks
II. A spread sheet containing control coordinate listings
III. A spread sheet containing point coordinate listings
IV. A spread sheet containing sketches
V. A word document containing photos
VI. DWG and DXF files of the Pick up.

All these information is attached with this report.

6. DATUM

Plane Datum – PAGA Grid – origin – BM164

Station	PAGA GRID (Plane)		
	Easting	Northing	CDW RL
BM164	108128.139	109135.973	64.155

Vertical Datum (CDW) – BM 198 from CDW report

7. RESULTS

All the manholes surveyed have been doubled checked by both the JICA and the APS field team and have proven to be the same as the original observations.
Office computations of these measurements were also checked more than once and have been to the satisfaction of the persons concerned.
GPS control computations and reductions were done by our GPS specialist using the GNSS Solutions.

8. CONLUSION

The survey field work commenced on the 03/03/2011 and was officially completed on the 25/05/2011.
A total of seventy four manholes were surveyed within this timeframe including eight more and several field checks.
Some difficulties were encountered when some manholes were not visible to survey that we had to spend hours looking for them.
However alternative manholes along the same sewer line were surveyed when ever we could not find the right one.
Despite some difficulties and challenges faced, a great deal of effort was put into this project to successfully compete it.

APPENDICES

Appendix A

CONTROL LISTINGS
Control Points used in this Project

Point	EASTING	NORTHING	RL (CDW)	Code
1	104255.510	108484.691	1.846	SW01
2	104272.790	108539.413	3.615	SW02
3	104804.443	107971.674	3.608	SW03
4	104841.316	107948.913	3.227	SW04
5	105031.796	104802.968	31.608	SW05
6	105065.346	104789.301	33.707	SW06
7	105131.131	104989.652	50.637	SW07
8	105105.977	104951.492	51.441	SW08
9	105318.045	105300.785	70.024	SW09
10	105287.574	105260.648	71.712	SW10
11	106178.864	105402.684	90.798	SW11
12	106202.553	105441.695	92.884	SW12
13	105419.278	106983.705	1.928	SW13
14	105526.945	106845.164	7.511	SW14
15	106097.916	105289.770	63.746	SW 15
16	106115.753	105222.007	59.607	SW16
17	105444.854	105396.139	111.136	SW17
18	105420.684	105482.629	113.890	SW18
19	104444.416	104757.134	46.235	SW19
20	104500.934	104695.902	51.708	SW20
21	104798.561	104315.873	1.392	SW21
23	107208.582	104918.355	11.557	SW23
24	107277.191	104969.338	15.735	SW24
25	105529.115	105839.752	22.780	SW25
26	105627.124	105766.206	25.483	SW26
31	107998.484	104934.796	26.419	SW31
32	107916.137	104986.936	24.295	SW32
33	108642.854	105032.256	88.804	SW33
34	108492.030	105053.125	80.571	SW34

35	108260.152	104440.027	20.960	SW35
36	108348.442	104287.307	17.039	SW36
43	106242.186	105758.039	15.234	SW43
44	106137.749	105777.834	12.289	SW44
109	106119.739	105255.654	62.764	DPY 109
110	106273.927	105226.505	85.175	DPY 110
121	106611.339	104906.746	98.316	PM014
133	106785.803	104683.690	12.929	PS133
134	106910.199	104836.798	10.505	PS134
191	103798.892	109162.272	1.898	BM 191
1291	108914.393	103725.492	17.006	SW39
1292	109102.188	103571.951	10.818	SW40
1401	104823.527	104226.813	1.571	SW 22
1441	108148.885	103359.574	3.448	PS008
1442	108287.276	103229.475	2.513	PS009
1443	108108.185	103405.882	4.071	SW41
1499	107492.012	105212.892	24.740	SW29
1500	107587.779	105174.948	30.988	SW30

Appendix B

Photos showing the inside and the top view of the 82 manholes surveyed.

KANUDI

M*****(Lower)

M*****(Middle) - GL = +1.416m
BOP = +0.690m
h = 0.726m

M***** (Upper)

IDUBADA/Pom Tech

M55501

M55502 – GL = +1.460m
BOP = +0.248m
h = 1.212m

M***** - GL = +1.196m

BOP = -1.020m

h = 2.216m

HAGARA/Gabi

M55508

M55509

M55510 – GL = +3.568m
BOP = +1.503m
h = 2.065m

*Approximately 7.00m NE of M55509

<u>HANUABADA/Champion Prd</u>

M75410 – GL = +2.515m
BOP = +0.368m
h = 2.147m

HANUABADA/Prov.Govt Office

M75416

M75417 – GL = +6.341m
BOP = +4.810m
h = 1.531m

KONEDOBU

M75367 (Next to Kone Pump Stn) – GL = +11.182m
BOP = +9.011m
h = 2.172m

Ela Makana/Elenese Rd

M753B3 – GL = +15.453m
BOP = +14.153m
h = 1.300m

M753B1 – GL = +12.494m

BOP = +10.353m

h = 2.141m

KONE/Aviat St.

M75357

M75345

GRANVILLE/Ela Makana St.

M752A5 – GL = +88.755m
BOP = +87.353m
h = 1.402m

M752A6 – GL = +89.197m
BOP = +86.951m
h = 2.246m

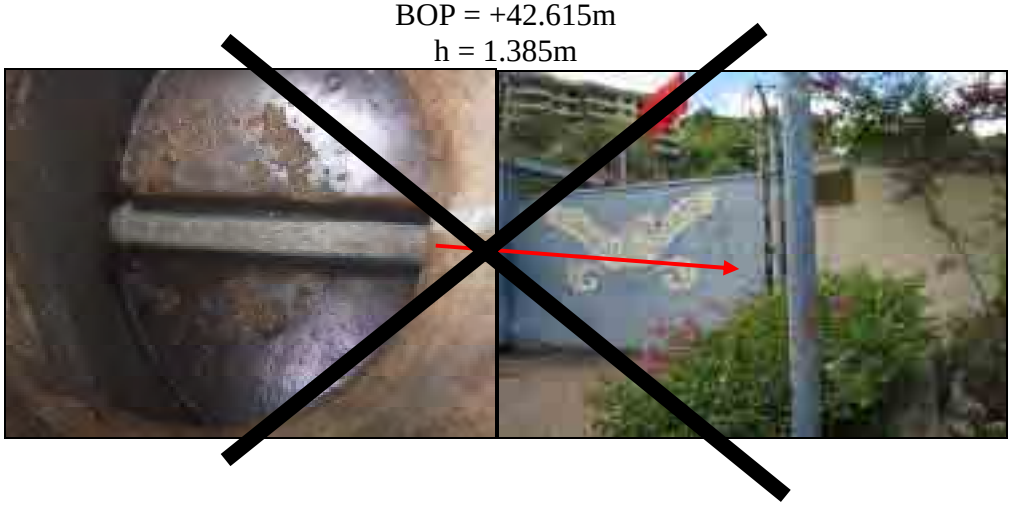
GRANVILLE/Chester St.

M85233 – GL = +95.308m
BOP = +92.108m
h = 3.200m

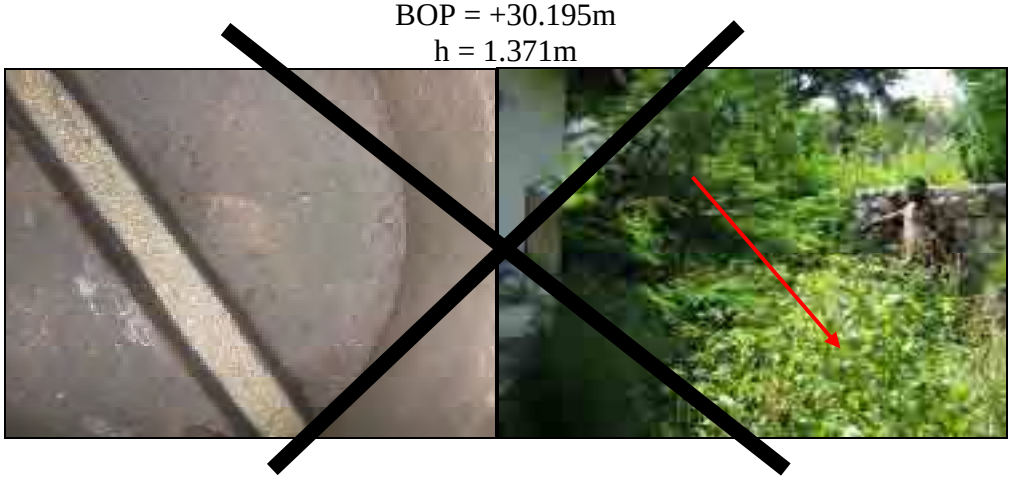
M85234 – GL = +96.948m
BOP = +93.529m
h = 3.419m

GRANVILLE/Lawes RD.

M752D6 – GL = +44.00m
BOP = +42.615m
h = 1.385m



M752D7 – GL = 31.566m
BOP = +30.195m
h = 1.371m



M75285 – GL = 62.068m
BOP = +60.858m
h = 1.210m

M75298 – GL = +63.789m
BOP = +61.798m
h = 1.991m

CRATCHLY RD/Sarama Pl

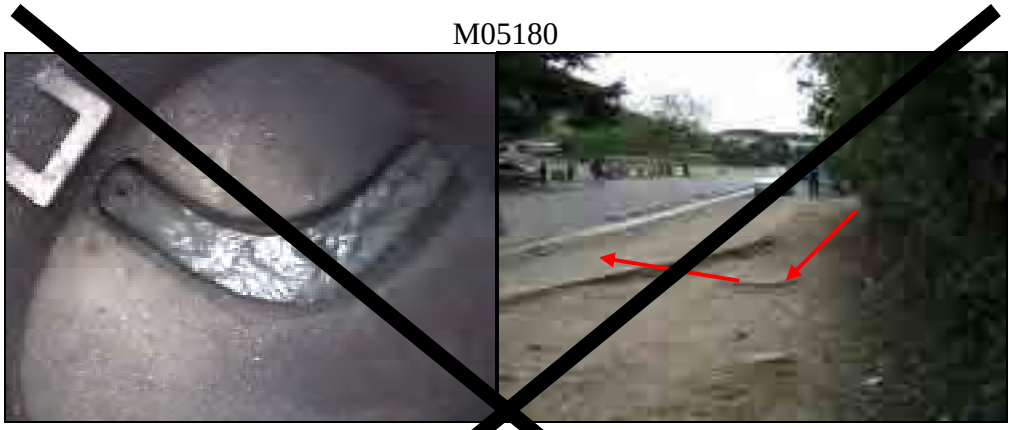
M05132 – (Level Checked by Arman larmer Surveys)

M05131 – (No Data)

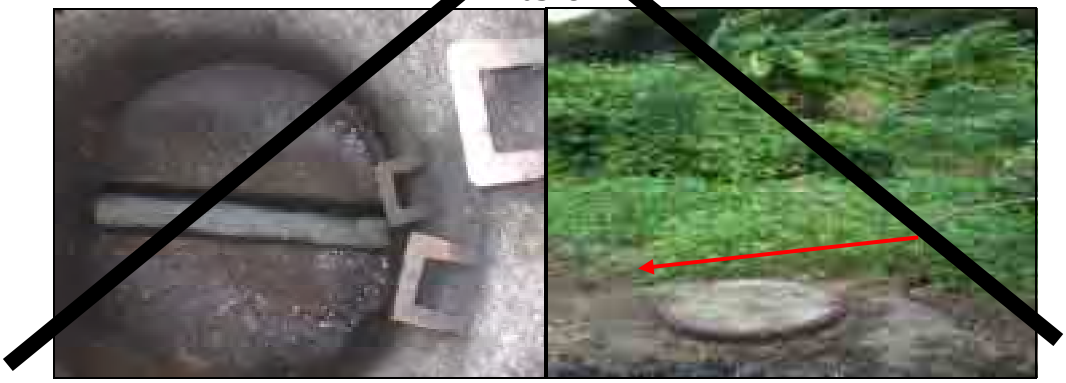
*Cemented..

SCRATCHLY RD/Kila High

M05180



M05181



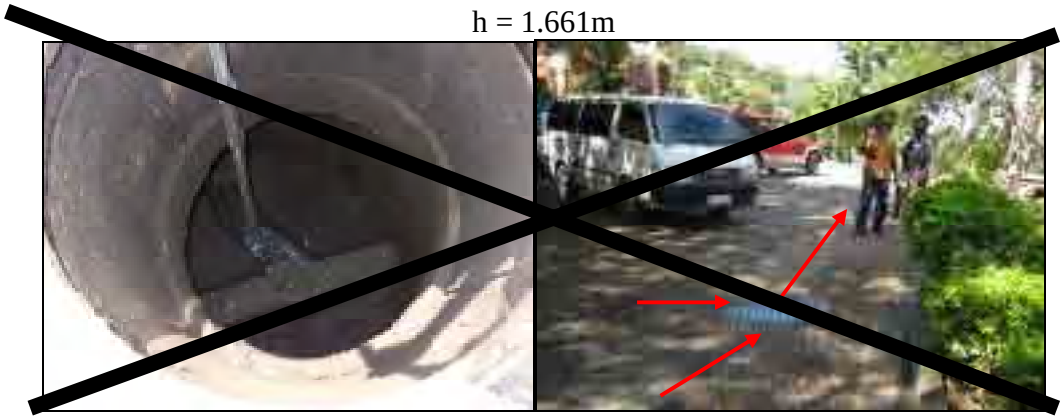
PAGA HILL/Bougainville Cr (CANCEL)

M65104

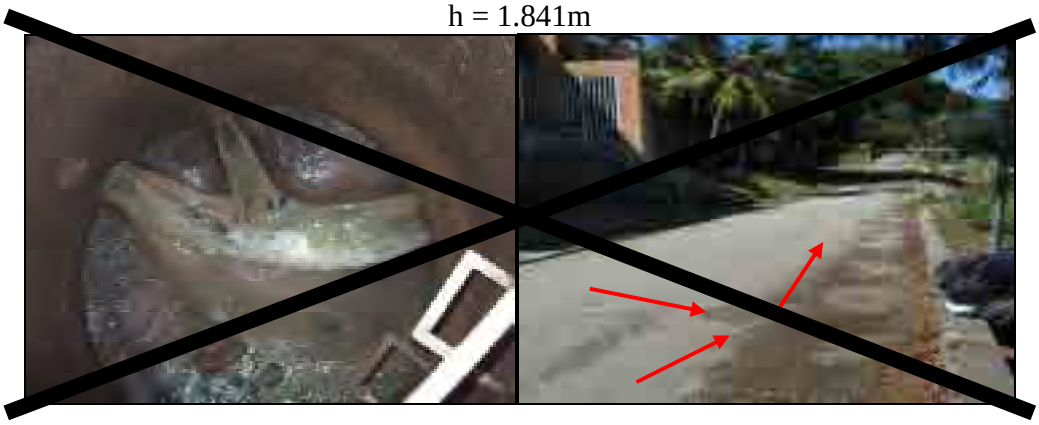
M65203

GRANVILLE/Pandora Cr

M65292 – GL = +63.032m
BOP = +41.371m
h = 1.661m



M65293 – GL = +46.594m
BOP = +44.753m
h = 1.841m



GRANVILLE/Vanama Cr

M75234 – GL = +41.518m
BOP = +39.774m
h = 1.774m

M75272 – GL = 24.895m
BOP = +23.970m
h = 0.925m

KOKI/Hubert Murray High Way

M85262 – GL = +7.749m
BOP = +5.932m
h = 1.817m

M85263 – GL = +9.461m
BOP = +8.793m
h = 0.668m

M85264 – GL = +12.071m

“BOP BLOCKED”

M85265 – GL = +16.251m
BOP = +14.690m
h = 1.561m

M85267 – GL = +5.215m
BOP = +3.554m
h = 1.661m

M85268 – GL = 7.817m
BOP = +4.322m
h = 3.495m

M85269 – GL = +7.899m
BOP = +6.279m
h = +1.620m

BADILI/ Median Park

M85292 – GL = +23.806m
BOP = +22.490m
h = 1.316m

M85293 – GL = +15.857m
BOP = +14.619m
h = 1.238m

M95227 – GL = +11.751m
BOP = +8.340m
h = 3.411m

M95231 – GL = +12.701m
BOP = +10.575m
h = 2.126m

* Yellow arrow indicates the location of M95227..

M85287

<u>KOKI/Lambden St.</u>

M852B2 – GL = +10.749m
BOP = +10.175m

h = 0.574m

M852B1 – GL = +11.492m
BOP = +11.189m
h = 0.803m

<u>KOKI/Koki St.</u>

M85252 – GL = +10.357m
BOP = +9.326m
h = 1.031m

M85273 – GL = +11.883m
BOP =+10.740m
h = 1.143m

M85250

M85253 – GL = +1.971m
BOP = +1.356m
h = 0.615m

BADILI/Talai

M95235

M95236

HUBERT MURRAY H/W (2Mile Hill)

M05235 – GL = +81.914m
BOP = +79.338m
h = 2.576m

M05236

*Needs repair..

MUNIOGO CR/Govt. Store

M95262 – GL = +23.003m
BOP = +21.380m
h = 1.623m

M95263 – GL = +27.129m
BOP = +25.611m
h = 1.518m

MUNIOGO CR/Savachta Cl

M95277 – GL = +30.420m
BOP = +28.483m
h = 1.390m

M95278 – GL = +34.189m
BOP = +32.799m
h = 1.390m

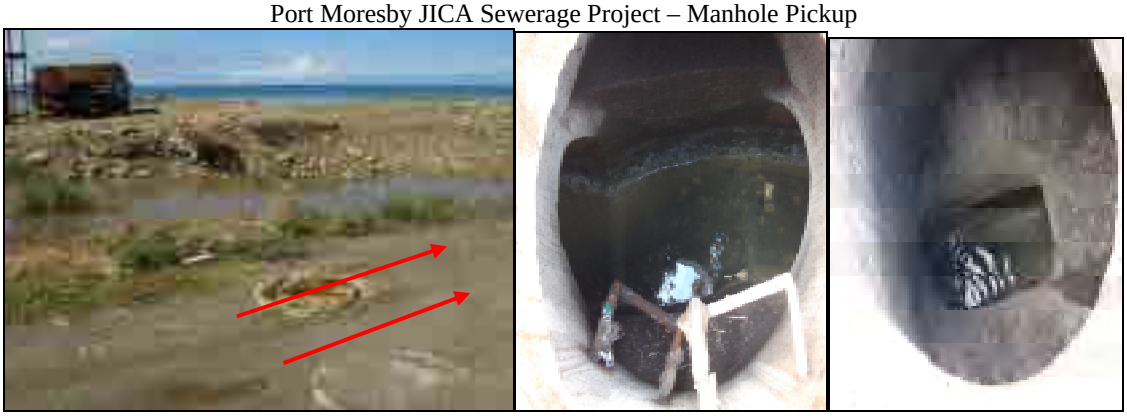
MUNIOGO Cr

M95255 – GL = 28.576m
BOP = +27.012m
h = 1.562m

TOWN/Ela Beach

M65143 – GL = +1.482m & M65131 – GL = +1.498m
BOP = -0.529m
M65143 is cemented h = 2.027m

M65144 – GL = +1.261m & M65129
BOP = -0.523m
h = 1.784m



GRANVILLE/Hunter St.

M652D2 – GL = +31.793m
BOP = +30.289m
h = 1.504m

M652D3 – GL = +34.181m
BOP = +32.384m
h = 1.797m

GRANVILLE/Airvos Av.

M**** - GL = +68.159m
BOP = +66.078m
h = 2.081

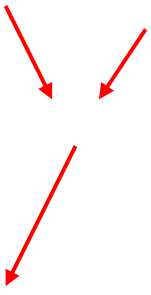
M***** - GL = 70.314m
BOP = +68.658m
h = 1.656m

M652A1 – GL = +70.238m
BOP = 68.010m
h = 2.228m

M65299 – GL = +68.381m
BOP = 66.864m
h = 1.517m

GRANVILLE/Davetari Dr

M75209 – GL = +113.531m
BOP = +112.272m
h = 1.259m



M75208 – GL = +110.571m

PANDORA CR/Bevan St.

M***** - GL = +44.650m
BOP = +43.116m
h = 1.534m

M***** - GL = +43.700m
BOP = +42.502m
h = 1.198m

* Yellow arrow indicates location of upper manhole..

SCRATCHLY RD/Gabutu Jnct

M05102 – GL = +18.999m
BOP = +16.472m
h = 2.527m

M05103 – GL = +17.749m

* Blocked..

GABUTU

(Storm Water Pit)

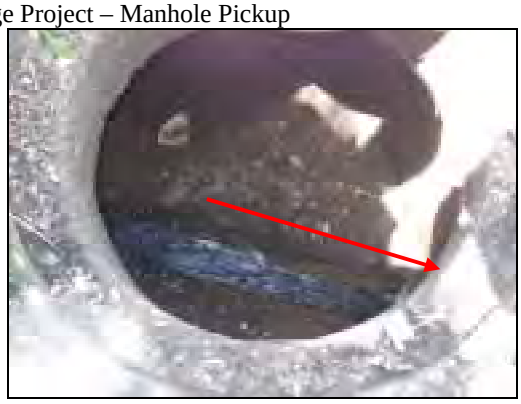
GL = +3.502m
BOP = +2.068m
h = 1.434m

M95001 – GL = +6.288m
BOP = +4.609m
h = 1.679m

<u>GABUTU (Kila Police Depot/Barracks)</u>

M05001 – GL = +10.897m
BOP = +9.590m
h = 1.307m

M05005 – GL = +14.997m
BOP = +13.750m
h = 1.247m



(Kila Police Outfall)

M*****(Upper) – GL = +1.542m
BOP = +0.221m
h = 1.321m

M*****(Middle) – GL = +0.915m
BOP = -0.520m
h = 1.435m

M****** (Lower MH right on the beach – photo not available)

Note:
**Some shots of the inside or top view of some manholes may not be available.*

Appendix C

Manhole Positions and Ground levels in their respective locations.

	PAGA GRID		CDW			
Point #	EASTING	NORTHING	RL(GL)	Code	MH#	Location
1000	104763.022	107976.966	1.918	T/MH	M55509	Hagara/Gabi
1006	104720.657	107963.600	0.719	T/MH	M55508	Hagara/Gabi
1012	105071.835	104787.255	34.181	T/MH	M652D3	Town/Hunter St.
1018	105033.162	104800.646	31.793	T/MH	M652D2	Town/Hunter St.
1023	104233.623	108593.384	4.365	T/MH	M55502	Idubada/Pom Tech
1029	104201.875	108467.893	1.460	T/MH	M55501	Idubada/Pom Tech
1039	105090.248	105171.787	46.594	T/MH	M65293	Pandora Cres
1047	105097.772	105113.396	43.032	T/MH	M65292	Pandora Cres
1056	105590.839	106704.043	6.341	T/MH	M75417	Kone/Prov.Gvt Off.
1062	105650.967	106712.221	10.330	T/MH	M75416	Kone/Prov.Gvt Off.
1079	105319.376	105305.683	70.238	T/MH	M652A1	Airvos Avenue
1088	105309.567	105311.010	68.381	T/MH	M65299	Airvos Avenue
1094	106220.810	105374.085	89.197	T/MH	M752A6	Ela Makana
1100	106255.399	105307.969	88.755	T/MH	M752A5	Ela Makana
1106	107207.208	105083.898	30.971	T/MH	M85293	Badili/Median Park
1118	104541.311	104631.021	48.595	T/MH	M65208	Paga/Bougainville Cr
1126	104573.198	104559.620	54.731	T/MH	M65209	Paga/Bougainville Cr
1134	106572.249	104886.494	95.308	T/MH	M85233	Chester St.
1140	106631.800	104929.213	96.948	T/MH	M85234	Chester St.
1148	107377.199	104981.247	12.701	T/MH	M95231	Badili/Median Park
1154	107424.760	104953.319	11.751	T/MH	M95227	Badili/Median Park
1162	107181.231	104880.794	9.461	T/MH	M85263	Koki/Hbrt Mrry H/W
1168	107144.532	104881.904	7.817	T/MH	M85268	Koki/Hbrt Mrry H/W
1174	107099.030	104834.911	5.215	T/MH	M85267	Koki/Hbrt Mrry H/W
1180	107075.599	104904.138	7.899	T/MH	M85269	Koki/Hbrt Mrry H/W
1186	103690.666	109225.701	1.322	T/MH	M*****	Kanudi
1194	103805.970	109196.740	3.031	T/MH	M*****	Kanudi
1202	106045.172	105317.719	62.068	T/MH	M75285	Lawes Rd
1208	105868.234	105498.704	41.518	T/MH	M75272	Vanama Cres
1216	105890.986	105620.865	24.895	T/MH	M75304	Vanama Cres
1224	108024.414	105061.272	34.189	T/MH	M95278	Muniogo Cr/Savachta Pl
1231	108091.287	104857.689	23.003	T/MH	M95262	Muniogo Cr/Gvt.Store
1239	108131.446	104875.292	27.129	T/MH	M95263	Muniogo Cr/Gvt.Store
1245	106898.681	104833.081	10.357	T/MH	M85252	Koki/Koki St.
1253	106935.530	104910.794	11.883	T/MH	M85273	Koki/Koki St.
1259	107150.880	104849.543	7.749	T/MH	M85262	Koki/Hbrt Mrry H/W
1265	107210.896	104883.001	12.071	T/MH	M85264	Koki/Hbrt Mrry H/W
1266	107217.766	104860.006	16.251	T/MH	M85265	Koki/Hbrt Mrry H/W

1275	106113.553	105031.756	31.566	T/MH	M752D7	Lawes Rd
1284	108523.706	105045.510	81.914	T/MH	M05235	Hrbt Mrry H/W/2 mile hill
1290	108510.490	105022.413	74.626	T/MH	M05236	Hrbt Mrry H/W/2 mile hill
1294	109011.929	103681.308	15.063	T/MH	M05180	Scratchly Rd/Kila High
1300	108985.091	103637.967	14.311	T/MH	M05181	Scratchly Rd/Kila High
1308	105461.974	105403.182	113.531	T/MH	M75209	Davetari Dr.
1321	105325.676	105438.498	68.159	T/MH	M*****	Airvos Avenue
1329	105287.667	105465.856	70.314	T/MH	M*****	Airvos Avenue
1337	107207.367	104682.517	10.749	T/MH	M852B2	Koki/Lambden St.
1345	107239.171	104697.776	11.992	T/MH	M852B1	Koki/Lambden St.
1353	105186.802	105505.609	44.650	T/MH	M*****	Pandora Cr/Bevan St.
1361	105192.394	105474.037	43.700	T/MH	M*****	Pandora Cr/Bevan St.
1370	107968.398	105061.149	30.420	T/MH	M95277	Muniogo Cr/Savachta Pl
1377	106097.612	105290.007	63.789	T/MH	M75298	Lawes Rd
1386	105594.252	105775.621	31.815	T/MH	M75357	Aviat St
1392	105669.186	105779.447	16.114	T/MH	M75344	Aviat St
1404	104445.332	104121.176	1.482	T/MH	M65143	Ela Beach/Sea Park
1405	104444.255	104122.642	1.498	T/MH	M65131	Ela Beach/Sea Park
1411	104502.232	104181.345	1.290	T/MH	M65129	Ela Beach/Sea Park
1428	104503.330	104179.963	1.261	T/MH	M65144	Ela Beach/Sea Park
1429	106844.551	104777.721	6.917	T/MH	M85251	Koki/Le.Hunter/Koki St
1435	106850.225	104731.640	1.971	T/MH	M85253	Koki/Le.Hunter/Koki St
1446	108391.972	103170.466	10.897	T/MH	M05001	Kila Police Barracks
1457	108434.447	103147.809	14.997	T/MH	M05005	Kila Police Barracks
1458	108144.742	103376.052	3.502	T/PIT	Storm Water Pit	Gabutu
1468	108154.042	103415.562	6.288	T/MH	M95001	Gabutu
1476	106261.148	105713.882	15.453	T/MH	M753B2	Kone/Elenese Rd.
1486	106141.301	105776.570	12.494	T/MH	M753B1	Kone/Elenese Rd.
1502	107399.987	105339.693	32.449	T/MH	M95235	Badili/Talai Sttlmnt
1508	107358.883	105294.289	25.673	T/MH	M95236	Badili/Talai Sttlmnt
1514	108391.564	102929.432	1.542	T/MH	M*****	Kila Police Barracks
1516	108379.794	102926.592	0.915	T/MH	M*****	Kila Police Barracks
1518	108349.383	102916.912	-0.327	T/MH	M*****	Kila Police Barracks
1520	107255.073	105054.924	23.806	T/MH	M85292	Badili/Median Park
1522	107307.090	105139.055	15.857	T/MH	M85287	Badili/Median Park
1524	103738.912	109226.375	1.416	T/MH	M*****	Kanudi
1526	104179.179	108452.866	1.196	T/MH	M*****	Idubada/Pom Tech
1528	105440.478	106943.117	2.515	T/MH	M75410	Champion Prd/Hanuabada
1531	105366.850	105930.551	11.182	T/MH	M75367	Konedobu
14113	107749.638	105094.207	28.576	T/MH	M95255	Muniogo Cr
14121	108349.777	104310.739	18.999	T/MH	M05102	Scratchly Rd/Gabutu Jnct
14122	108373.356	104272.768	17.749	T/MH	M05103	Scratchly Rd/Gabutu Jnct

Appendix D

Sketches and computations of the manholes

Appendix E
Location Map of the surveyed route

Appendix F
Map of Manhole positions and Flow directions

*Note the above Appendices are attached to this report from a different document as per the above order.

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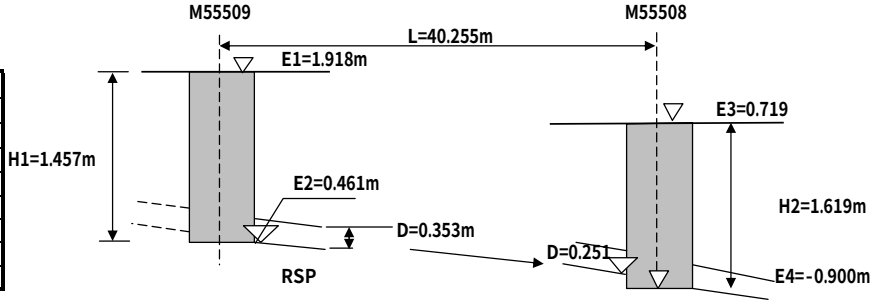
Keith ILAKINI
(Graduate Surveyor)

13/07/2011

POM JICA Project-Sewer Manhole Results
Revised 13/07/2011

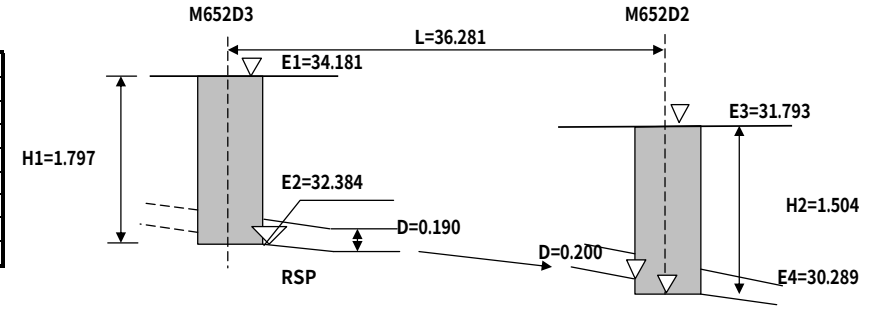
HAGARA/GABI

Upper MH			Lower MH
MH No	M55509		M55508
E1	1.918	E3	0.719
E2	0.461	E4	-0.900
D	0.353	D	0.251
L	40.255		
I=(E4-E2)/L	-0.034		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP)		



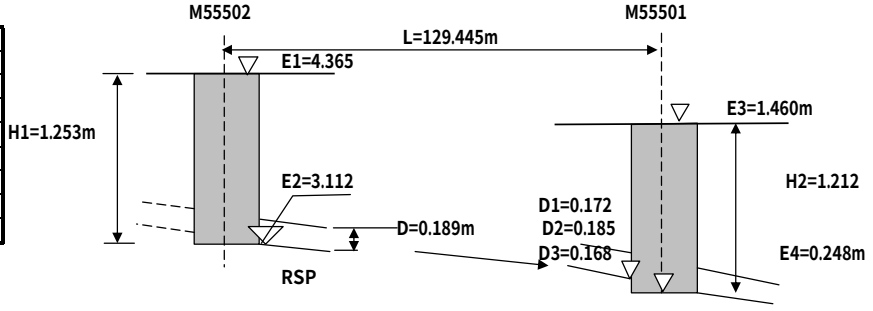
Hunter St

Upper MH			Lower MH
MH No	M652D3		M652D2
E1	34.181	E3	31.793
E2	32.384	E4	30.289
D	0.190	D	0.200
L	36.281		
I=(E4-E2)/L	-0.058		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP)		



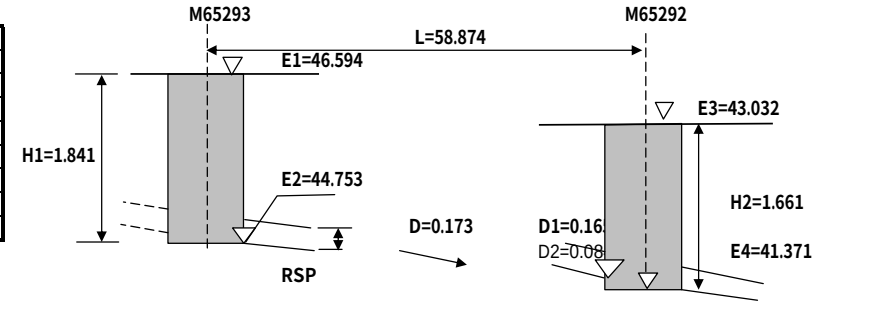
IDUBADA/POM TECH

Upper MH			Lower MH
MH No	M55502		M55501
E1	4.365	E3	1.460
E2	3.112	E4	0.248
D	0.189	D1	0.172
L	129.445	D2	0.185
I=(E4-E2)/L	-0.022	D3	0.168
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP)		



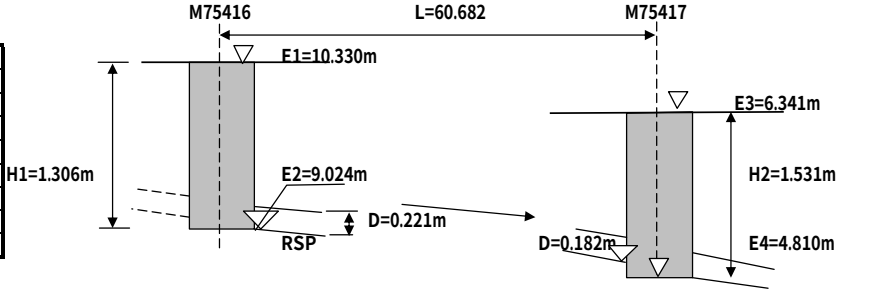
Pandora Cres

Upper MH			Lower MH
MH No	M65293		M65292
E1	46.594	E3	43.032
E2	44.753	E4	41.371
D	0.173	D1	0.165
L	58.874	D2	0.084
I=(E4-E2)/L	-0.057		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP)		



CHAMPION Prd(Central Prov.Educ. Off.)

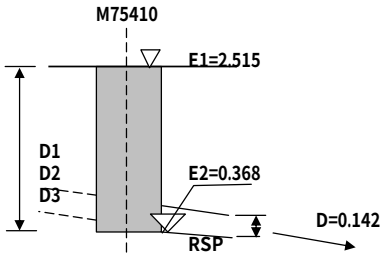
Upper MH		Lower MH	
MH No	M75416		M75417
E1	10.330	E3	6.341
E2	9.024	E4	4.810
D	0.221	D	0.182
L	60.682		
I=(E4-E2)/L	-0.069		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP)		



CHAMPION Prd/Hanuabada

ONE MANHOLE (1 MH)		
MH No	75410	
E1	2.515	
E2	0.368	
D1	0.158	D=0.142
D2	0.210	
D3	0.250	
L	nil	
I=(E4-E2)/L	nil	
MH Dia.	*0.600m(lid) & 0.530m(opening)*	
Remarks	Round Steel pipe(RSP)	

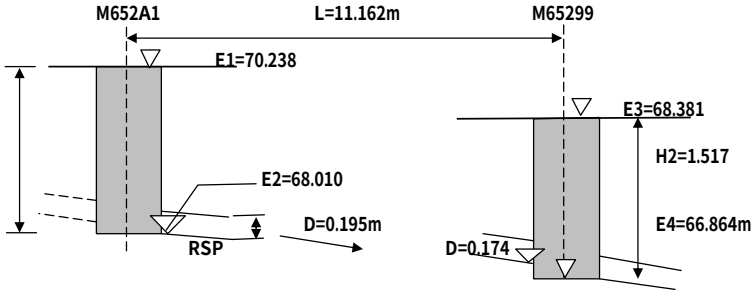
H1=2.147



Toaguba Hill/Airvos Av

Upper MH			Lower MH
MH No	652A1		65299
E1	70.238	E3	68.381
E2	68.010	E4	66.864
D	0.195	D	0.174
L	11.162		
I=(E4-E2)/L	-0.103		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP)		

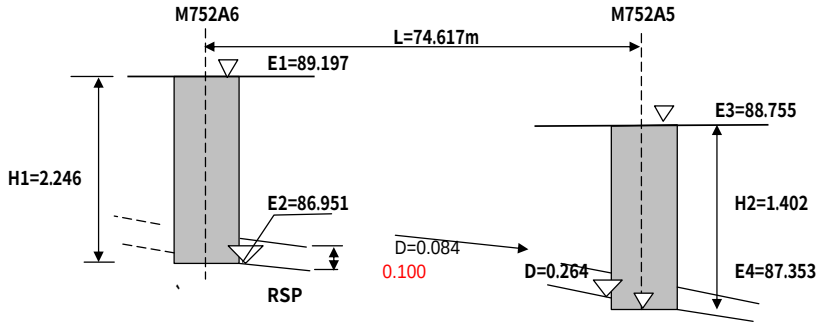
H1=2.228



Ela Makana

Upper MH			Lower MH
MH No	752A6		752A5
E1	89.197	E3	88.755
E2	86.951	E4	87.353
D	0.084	D	0.264
L	74.617		
I=(E4-E2)/L	0.005		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP)		

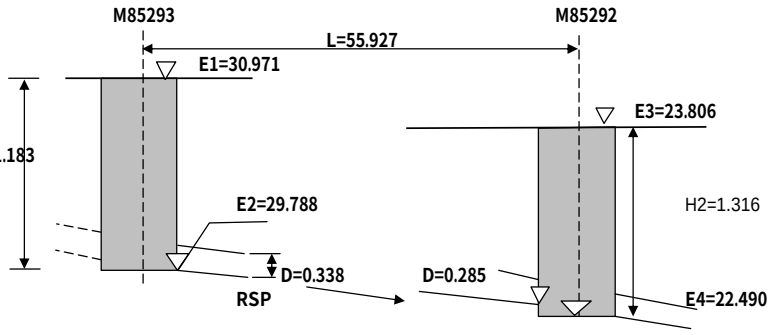
H1=2.246



Badili Intersect./Median park

Upper MH			Lower MH
MH No	M85293		M85292
E1	30.971	E3	23.806
E2	29.788	E4	22.490
D	0.338	D	0.285
L	55.951		
I=(E4-E2)/L	-0.130		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		

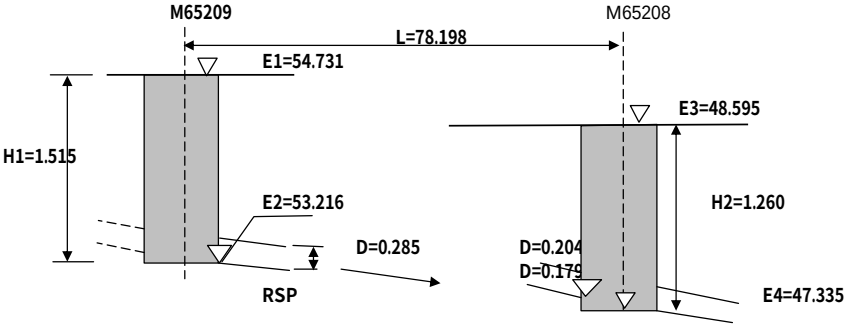
H1=1.183



Bougainille Cr

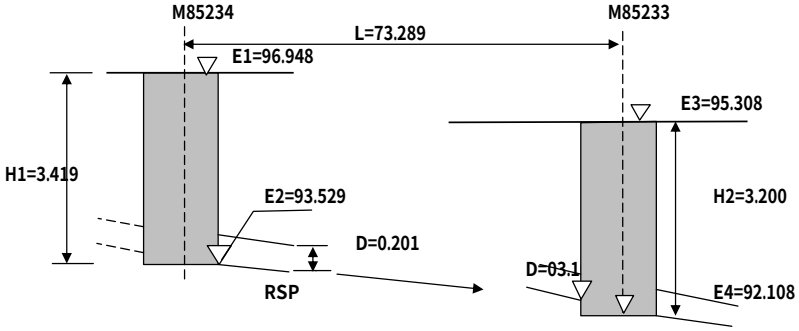
Upper MH			Lower MH
MH No	M65209		M65208
E1	54.731	E3	48.595
E2	53.216	E4	47.335
D	0.285	D1	0.204
L	78.198	D2	0.179
I=(E4-E2)/L	-0.075		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		

H1=1.515



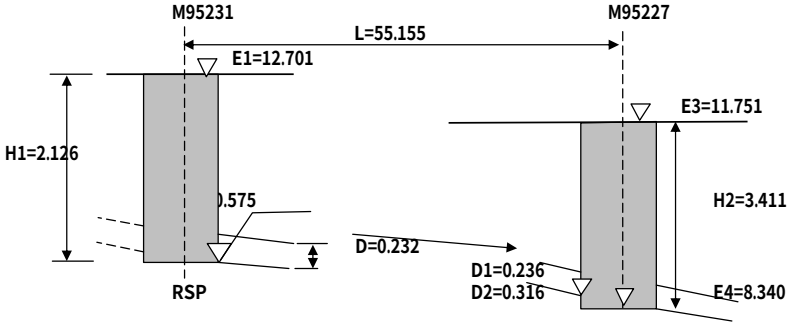
Chester St

Upper MH		Lower MH	
MH No	M85234		M85233
E1	96.948	E3	95.308
E2	93.529	E4	92.108
D	0.201	D	0.310
L	73.289		
I=(E4-E2)/L	-0.019		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



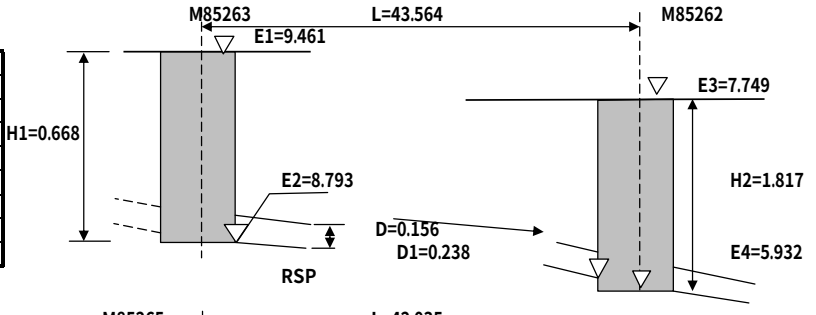
Badili/Median Park

Upper MH		Lower MH	
MH No	M95231		M95227
E1	12.701	E3	11.751
E2	10.575	E4	8.340
D	0.232	D1	0.236
L	55.155	D2	0.316
I=(E4-E2)/L	-0.041		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



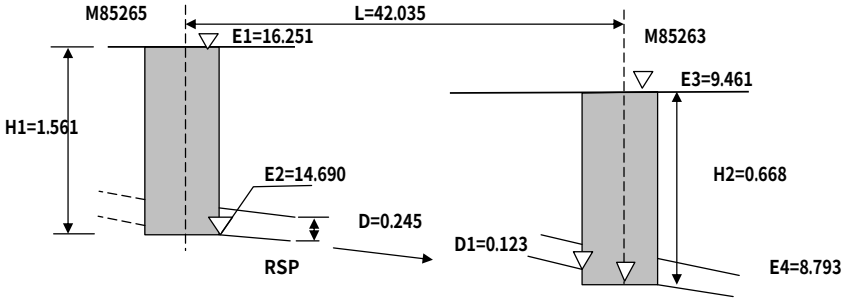
KOKI

Upper MH		Lower MH	
MH No	M85263		M85262
E1	9.461	E3	7.749
E2	8.793	E4	5.932
D	0.156	D1	0.238
L	43.564		
I=(E4-E2)/L	-0.066		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



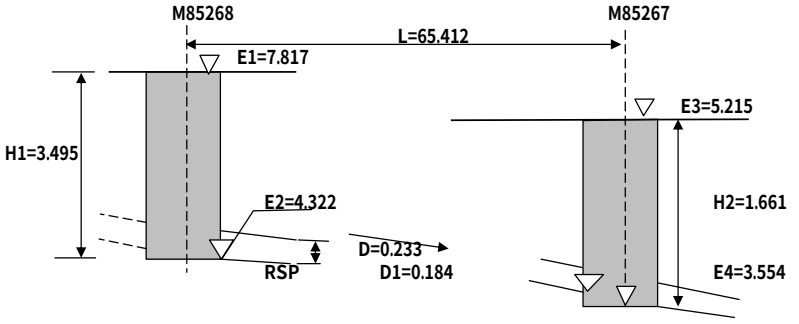
KOKI

Upper MH		Lower MH	
MH No	M85265		M85263
E1	16.251	E3	9.461
E2	14.690	E4	8.793
D	0.245	D1	0.123
L	42.035		
I=(E4-E2)/L	-0.140		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



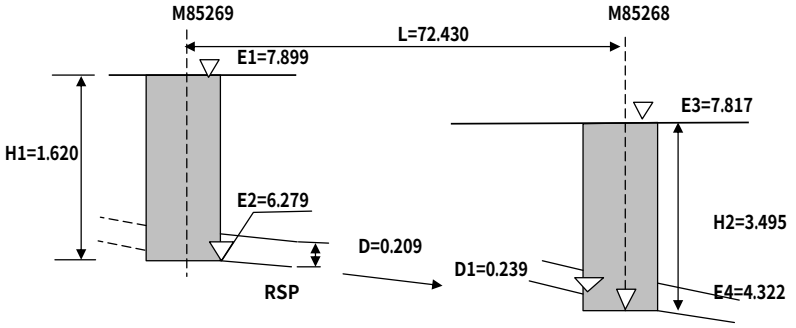
KOKI

Upper MH		Lower MH	
MH No	M85268		M85267
E1	7.817	E3	5.215
E2	4.322	E4	3.554
D	0.233	D1	0.184
L	65.412		
I=(E4-E2)/L	-0.012		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



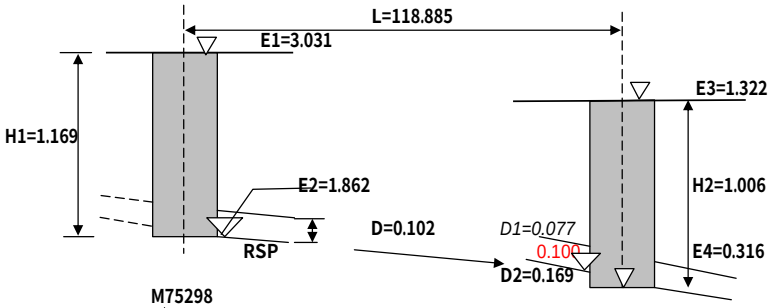
KOKI

Upper MH		Lower MH	
MH No	M85269		M85268
E1	7.899	E3	7.817
E2	6.279	E4	4.322
D	0.209	D1	0.239
L	72.430		
I=(E4-E2)/L	-0.027		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



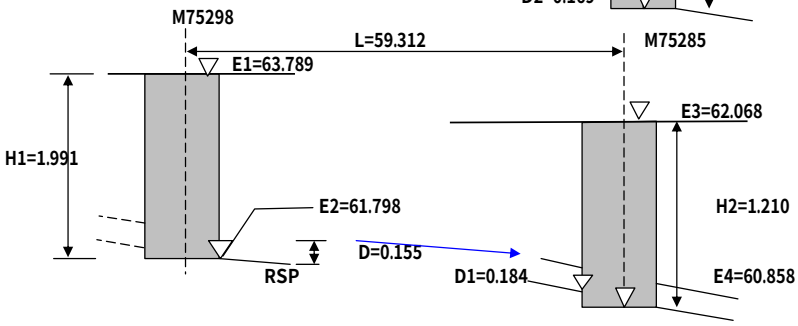
Kanudi

Upper MH		Lower MH	
MH No	M*****		M*****
E1	3.031	E3	1.322
E2	1.862	E4	0.316
D	0.102	D1	0.077
L	118.885	D2	0.169
I=(E4-E2)/L	-0.013		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



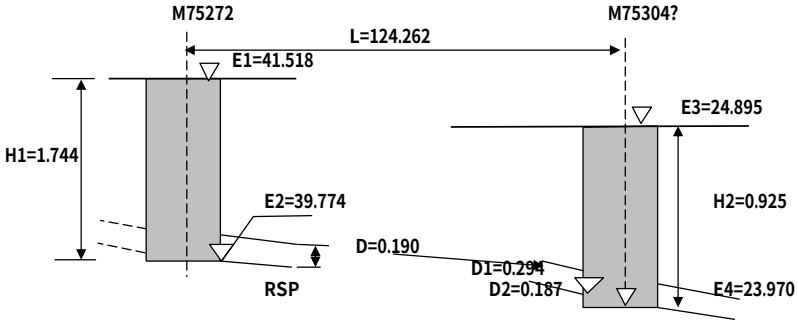
Granville/Lawes RD

Upper MH		Lower MH	
MH No	M75298		M75285
E1	63.789	E3	62.068
E2	61.798	E4	60.858
D	0.155	D1	0.184
L	59.312		
I=(E4-E2)/L	-0.016		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		
	Blue arrow=not directly to		



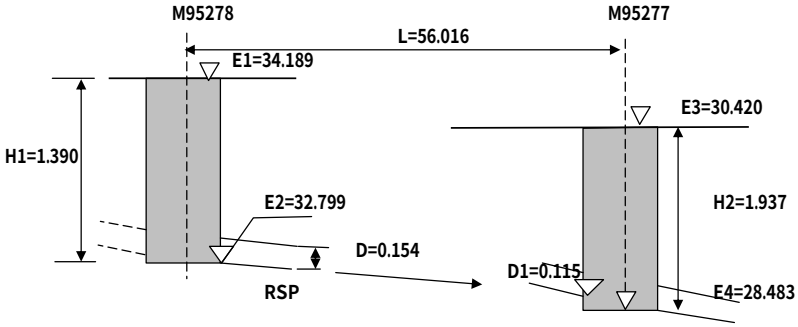
Vanama Cres

Upper MH		Lower MH	
MH No	M75272		M75234
E1	41.518	E3	24.895
E2	39.774	E4	23.970
D	0.190	D1	0.294
L	124.262	D2	0.187
I=(E4-E2)/L	-0.127		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



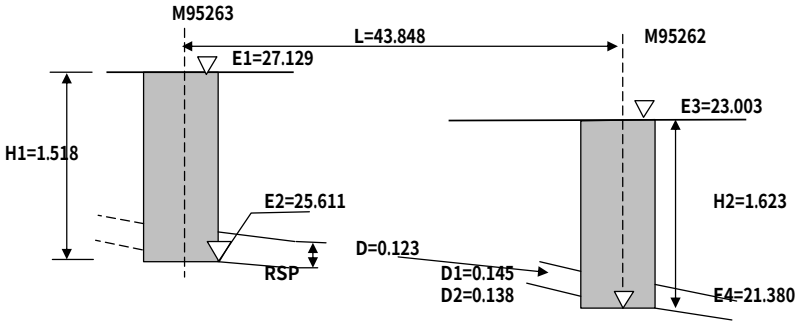
Muniogo Cr/Savachta Cl

Upper MH		Lower MH	
MH No	M95278		M95277
E1	34.189	E3	30.420
E2	32.799	E4	28.483
D	0.154	D1	0.115
L	56.016		
I=(E4-E2)/L	-0.077		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



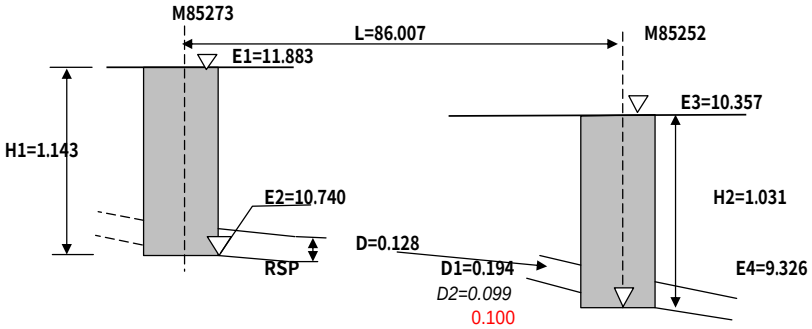
Muniogo Cr/Gvt.store

Upper MH			Lower MH
MH No	M95263		M95262
E1	27.129	E3	23.003
E2	25.611	E4	21.380
D	0.123	D1	0.145
L	43.848	D2	0.138
I=(E4-E2)/L	-0.096		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



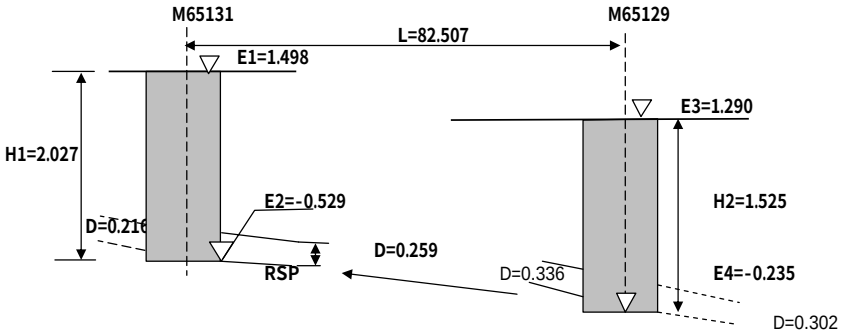
Koki St

Upper MH			Lower MH
MH No	M85273		M85252
E1	11.883	E3	10.357
E2	10.740	E4	9.326
D	0.128	D1	0.194
L	86.007	D2	0.099
I=(E4-E2)/L	-0.016		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



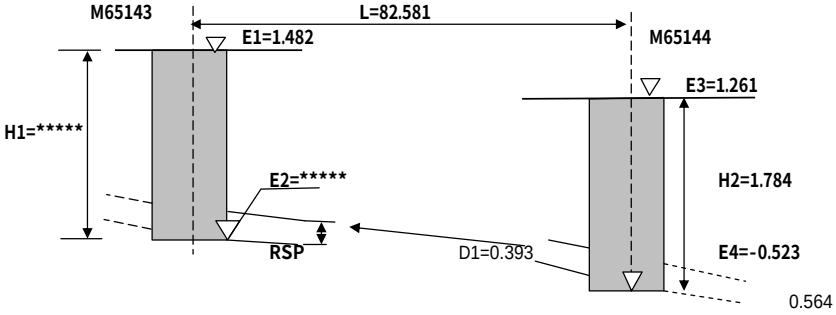
Ela Beach/ Sea park

Upper MH			Lower MH
MH No	M65131		M65129
E1	1.498	E3	1.290
E2	-0.529	E4	-0.235
D	0.216	D1	0.302
L	82.507		
I=(E4-E2)/L	0.004		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



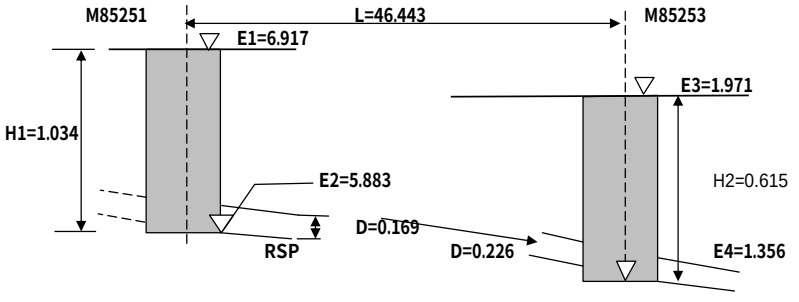
Ela Beach/ Sea park

Upper MH			Lower MH
MH No	65143		65144
E1	1.482	E3	1.261
E2	****	E4	-0.523
D		D1	0.393
L	82.581		
I=(E4-E2)/L			
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



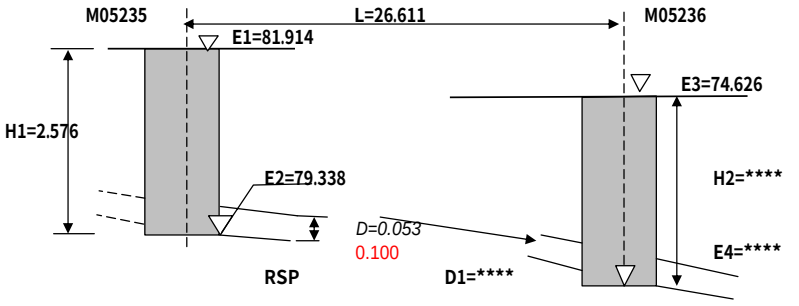
Koki St/Le hunter Rd

Upper MH			Lower MH
MH No	85251		85253
E1	6.917	E3	1.971
E2	5.883	E4	1.356
D	0.169	D1	0.226
L	46.428		
I=(E4-E2)/L	-0.098		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



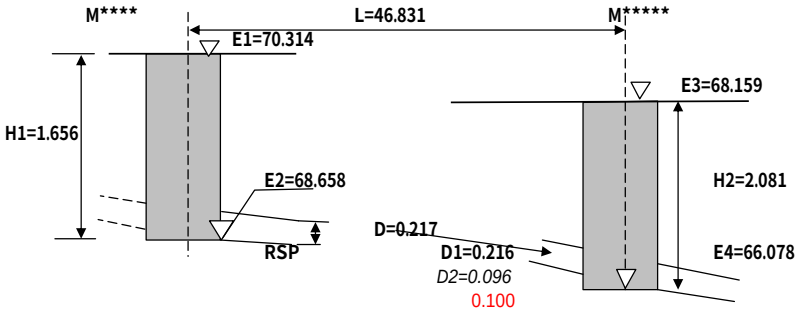
2 MILE HILL/Hubert Murray HW

Upper MH			Lower MH
MH No	M05235		M05236
E1	81.914	E3	74.626
E2	79.338	E4	****
D	0.053	D1	****
L	26.611		
I=(E4-E2)/L	****		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



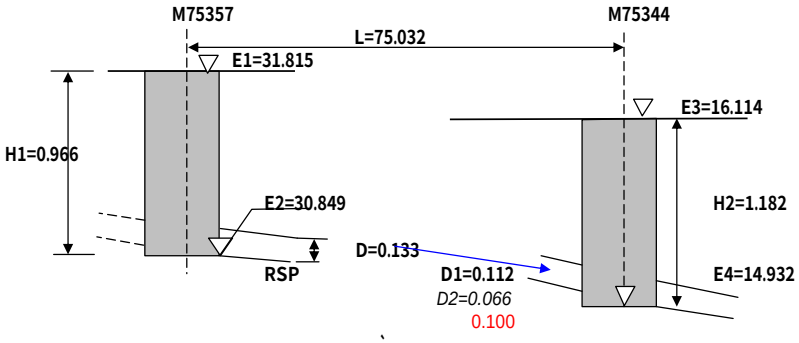
AIRVOS Av

Upper MH			Lower MH
MH No	*****		*****
E1	70.314	E3	68.159
E2	68.658	E4	66.078
D	0.217	D1	0.216
L	46.831	D2	0.096
I=(E4-E2)/L	-0.055		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



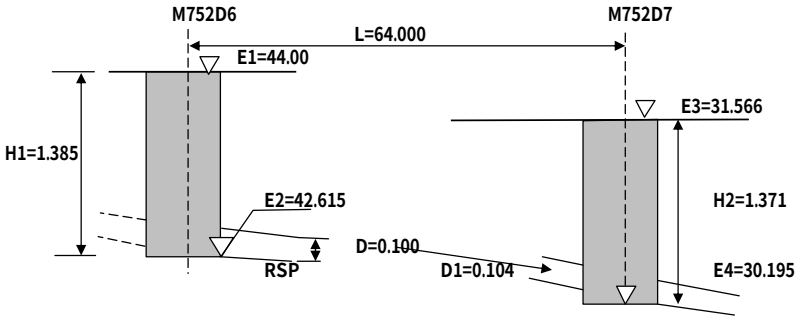
Aviat Street

Upper MH			Lower MH
MH No	75357		75344
E1	31.815	E3	16.114
E2	30.849	E4	14.932
D	0.133	D1	0.112
L	75.032	D2	0.066
I=(E4-E2)/L	-0.212		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		
	Blue arrow=not directly to		



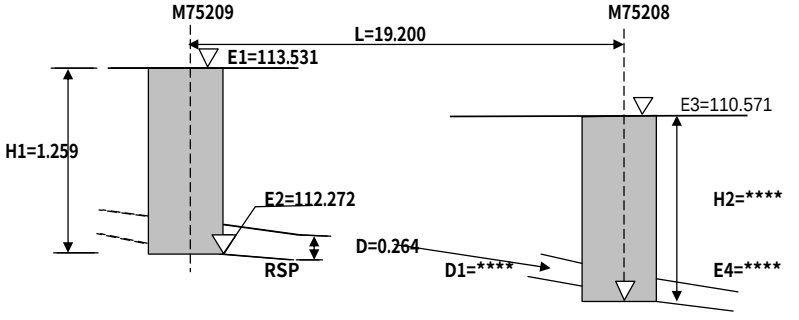
Chinese Comp/ Lawes RD

Upper MH			Lower MH
MH No	M752D6		M752D7
E1	44.000	E3	31.566
E2	42.615	E4	30.195
D	0.100	D1	0.104
L	64.000		
I=(E4-E2)/L	-0.194		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



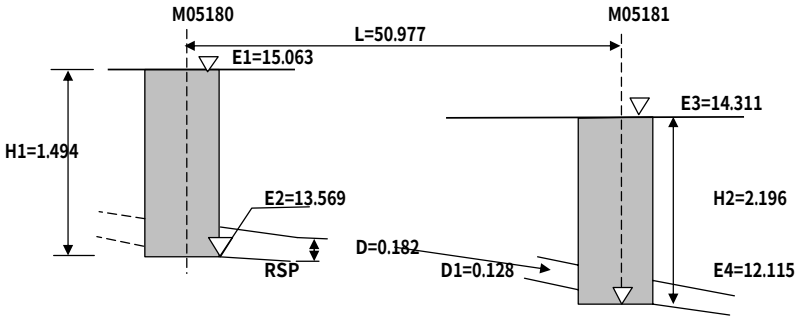
Davetari Drv

Upper MH			Lower MH
MH No	75209		75208
E1	113.531	E3	110.571
E2	112.272	E4	****
D	0.264	D1	****
L	19.200		
I=(E4-E2)/L			
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



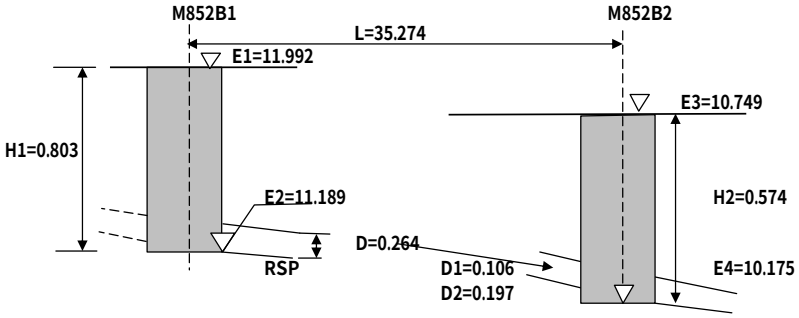
Kila Sec./Scratchly Rd

Upper MH		Lower MH	
MH No	M05180		M05181
E1	15.063	E3	14.311
E2	13.569	E4	12.115
D	0.182	D1	0.128
L	50.977		
I=(E4-E2)/L	-0.029		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



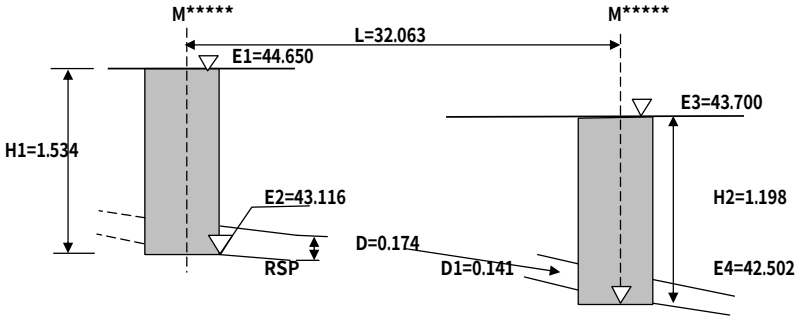
KOKI/Lamden St

Upper MH		Lower MH	
MH No	852B1		852B2
E1	11.992	E3	10.749
E2	11.189	E4	10.175
D	0.264	D1	0.106
L	35.274	D2	0.197
I=(E4-E2)/L	-0.029		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



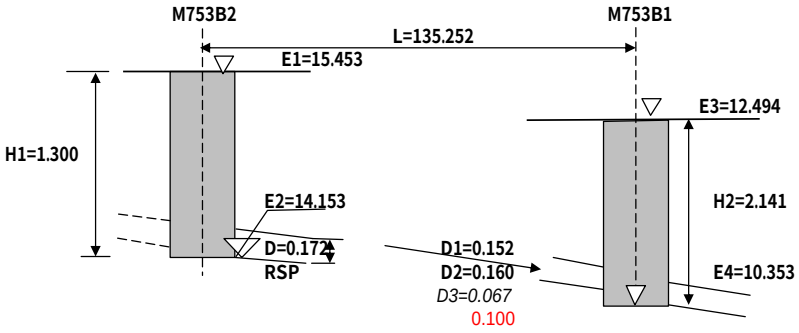
PANDORA CR/Bevan St

Upper MH		Lower MH	
MH No	*****		*****
E1	44.650	E3	43.700
E2	43.116	E4	42.502
D	0.174	D1	0.141
L	32.063		
I=(E4-E2)/L	-0.019		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



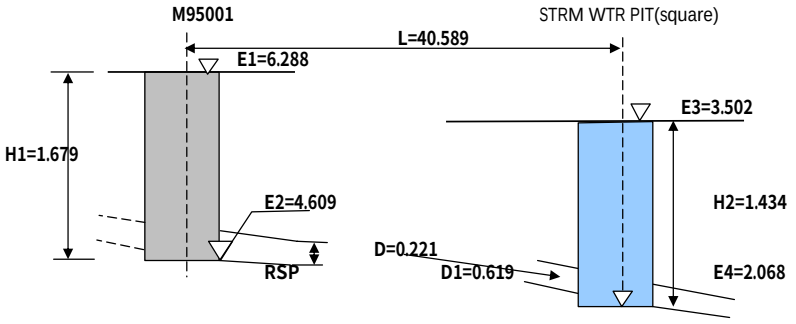
KONE/Elenese RD

Upper MH		Lower MH	
MH No	753B2		753B1
E1	15.453	E3	12.494
E2	14.153	E4	10.353
D	0.172	D1	0.152
L	135.252	D2	0.160
I=(E4-E2)/L	-0.028	D3	0.067
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



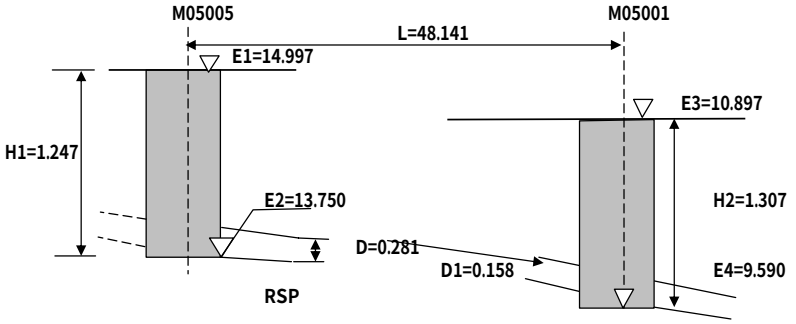
GABUTU Beach/Karius Rd

Upper MH		Lower MH	
MH No	M95001		STRM WTR PIT
E1	6.288	E3	3.502
E2	4.609	E4	2.068
D	0.221	D1	0.619
L	40.589		
I=(E4-E2)/L	-0.063		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



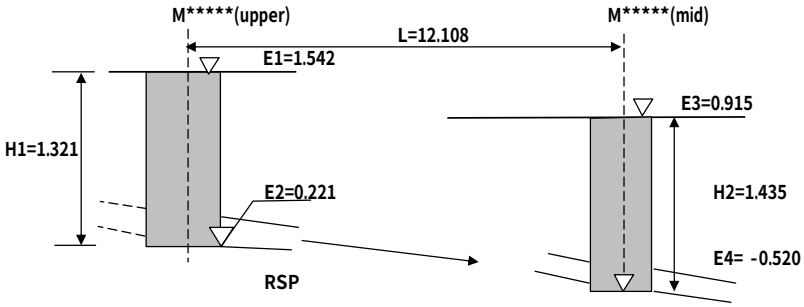
KILA POLICE DEPO/Karius Rd

Upper MH		Lower MH	
MH No	M05005		M05001
E1	14.997	E3	10.897
E2	13.750	E4	9.590
D	0.281	D1	0.158
L	48.141		
I=(E4-E2)/L	-0.086		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Round Steel pipe(RSP) in conc.		



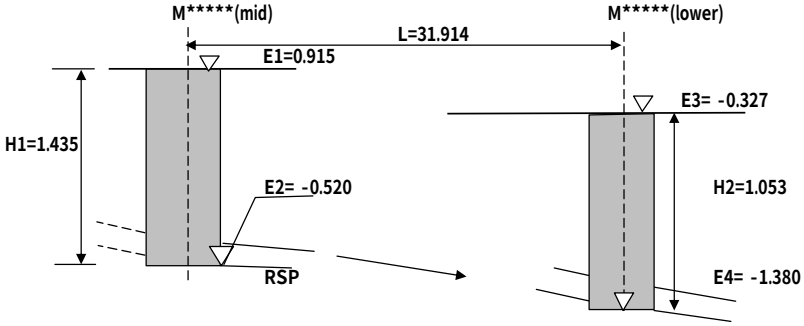
Kila Barracks

Upper mh		Mid mh	
MH#	M*****(upper)		M*****(mid)
E1	1.542	E3	0.915
E2	0.221	E4	-0.520
D	*****		
L	12.108		
I=(E4-E2)/L	-0.061		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks			



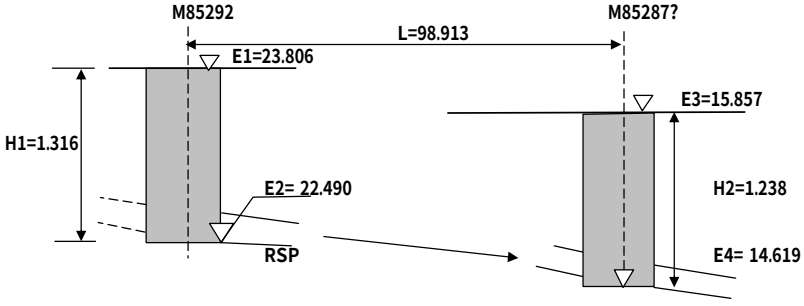
Kila Barracks

Mid mh		Lower mh	
MH#	M*****(mid)		M*****(lower)
E1	0.915	E3	-0.327
E2	-0.520	E4	-1.380
D	******		
L	31.914		
I=(E4-E2)/L	-0.027		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks			



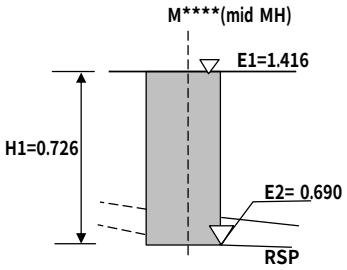
Badili/Median Park

Upper mh		Lower mh	
MH#	M85292		M85287?
E1	23.806	E3	15.857
E2	22.490	E4	14.619
D	******		
L	98.913		
I=(E4-E2)/L	-0.080		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks			



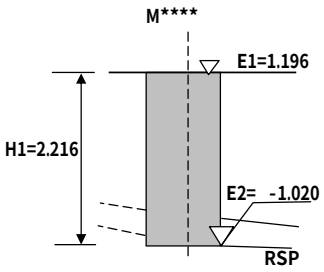
KANUDI

Mid mh			
MH#	M*****		
E1	1.416		
E2	0.690		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks			



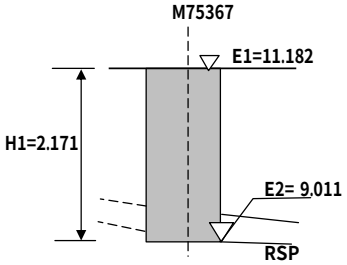
POM TECH

New MH			
MH#	M*****		
E1	1.196		
E2	-1.020		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks			



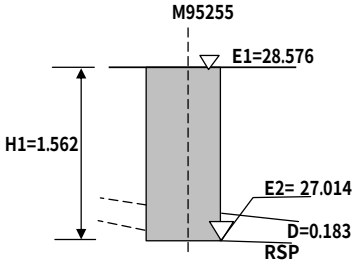
KONEDOBU

Next to Kone Pump Stn.			
MH#	M75367		
E1	11.182		
E2	9.011		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks			



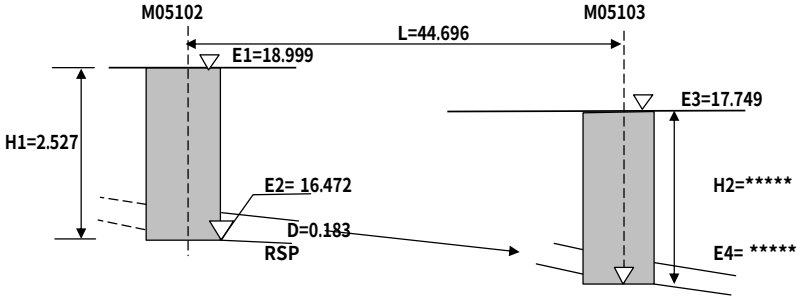
MUNIOGO CR

MH#	M95255		
E1	28.576		
E2	27.014		
D	0.183		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks			



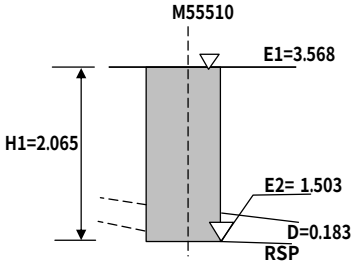
GABUTU Jnct/Scratchly Rd

	Upper MH		Lower MH
MH#	M05102		M05103
E1	18.999	E3	17.749
E2	16.472	E4	*****
L	44.696		
D	0.183		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks	Distance from M05102 to PIPE is 80.196 and its RL is 18.900		



GABI/HAGARA

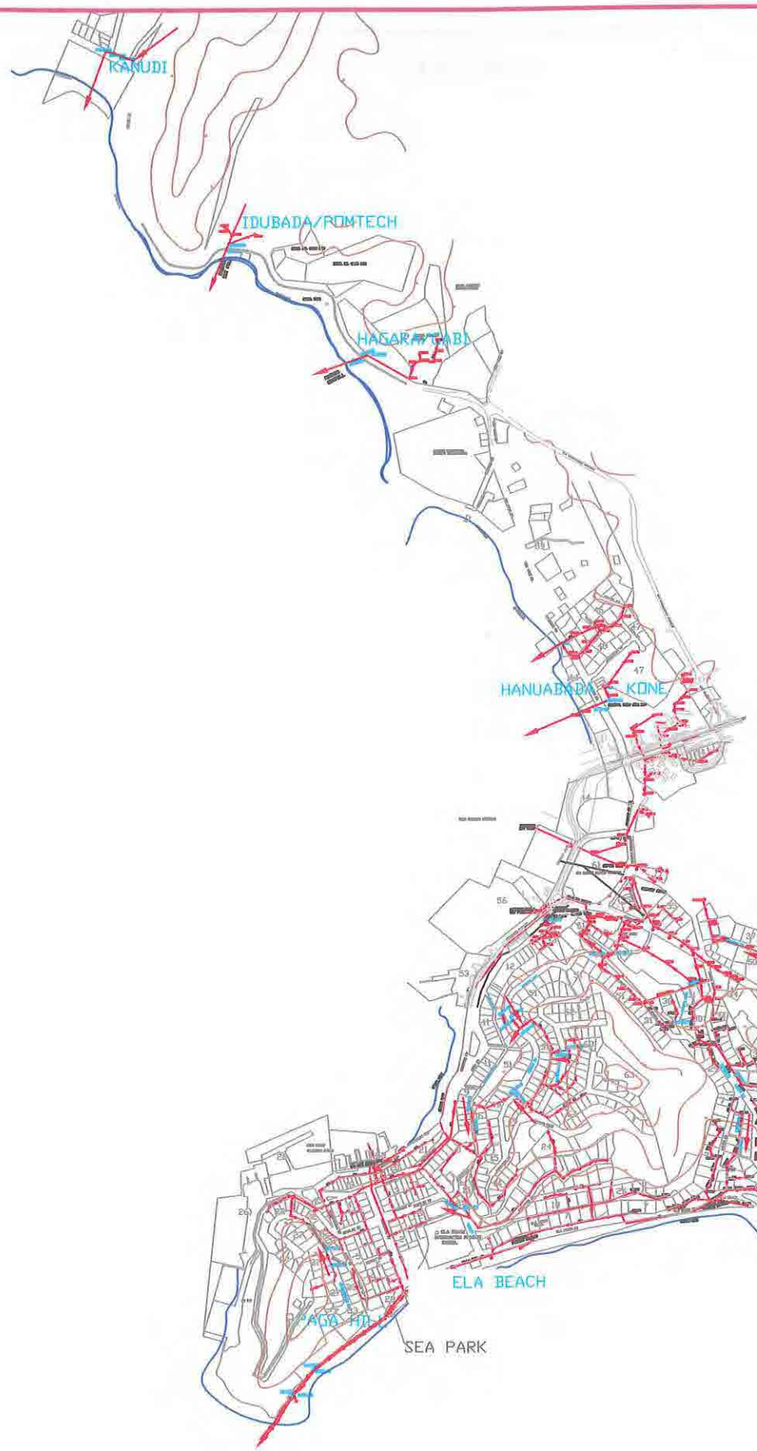
MH#	M55510		
E1	3.568		
E2	1.503		
D	*****		
MH Dia.	*0.600m(lid) & 0.530m(opening)*		
Remarks			



NOTE:
Asterix=Not available
Red ink=Rounded off to 1dp

Surveyed by: Keith ILAKINI (Graduate Surveyor)

.....



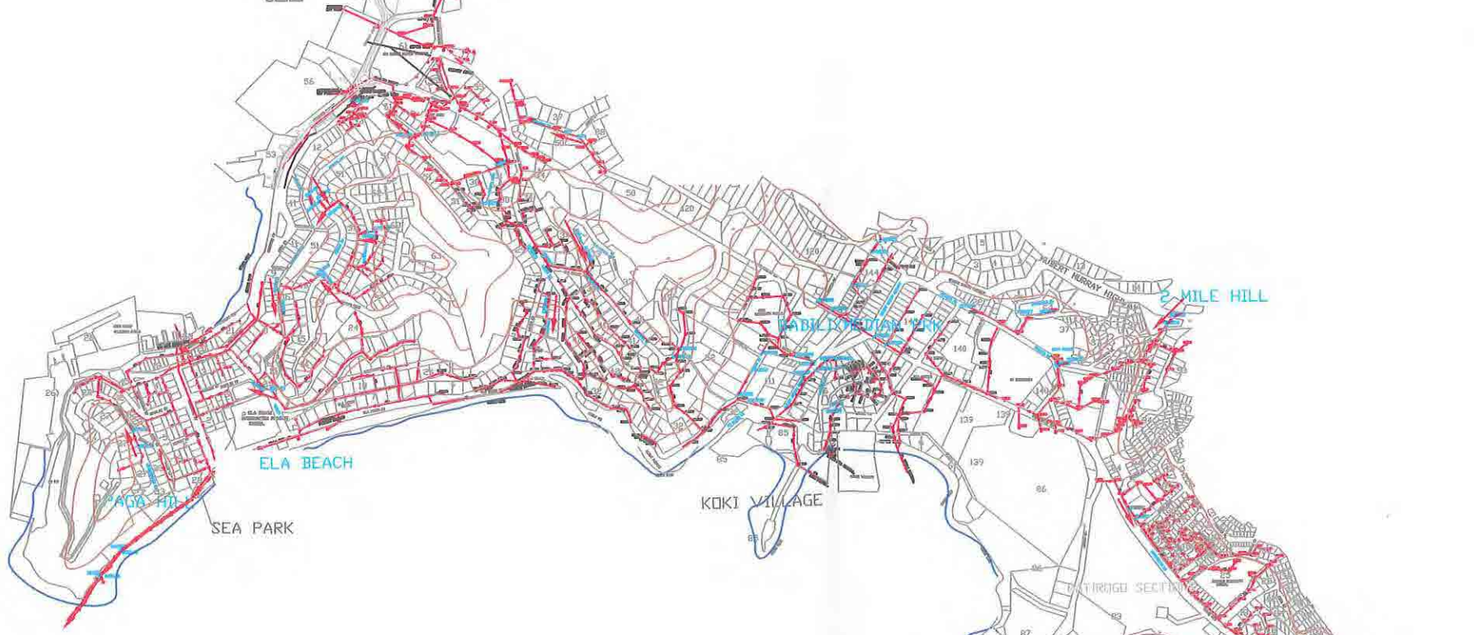
LEGEND

MANHOLE SURVEYED M55501

MANHOLE M55501

FLOW DIRECTION

GROUND CONTOUR 50



Amendments

Associated Consultants

Client

JICA

Project

JICA Port Moresby Sewerage Project

Details

SEWER MANHOLE Port Moresby

Scale NTS	
Level Datum	
Origin	
Surveyed KI	Date MAY 2011
Computed KI	Checked APS_JM
Ccad File MANHOLE1	Acad File MHPSTN1

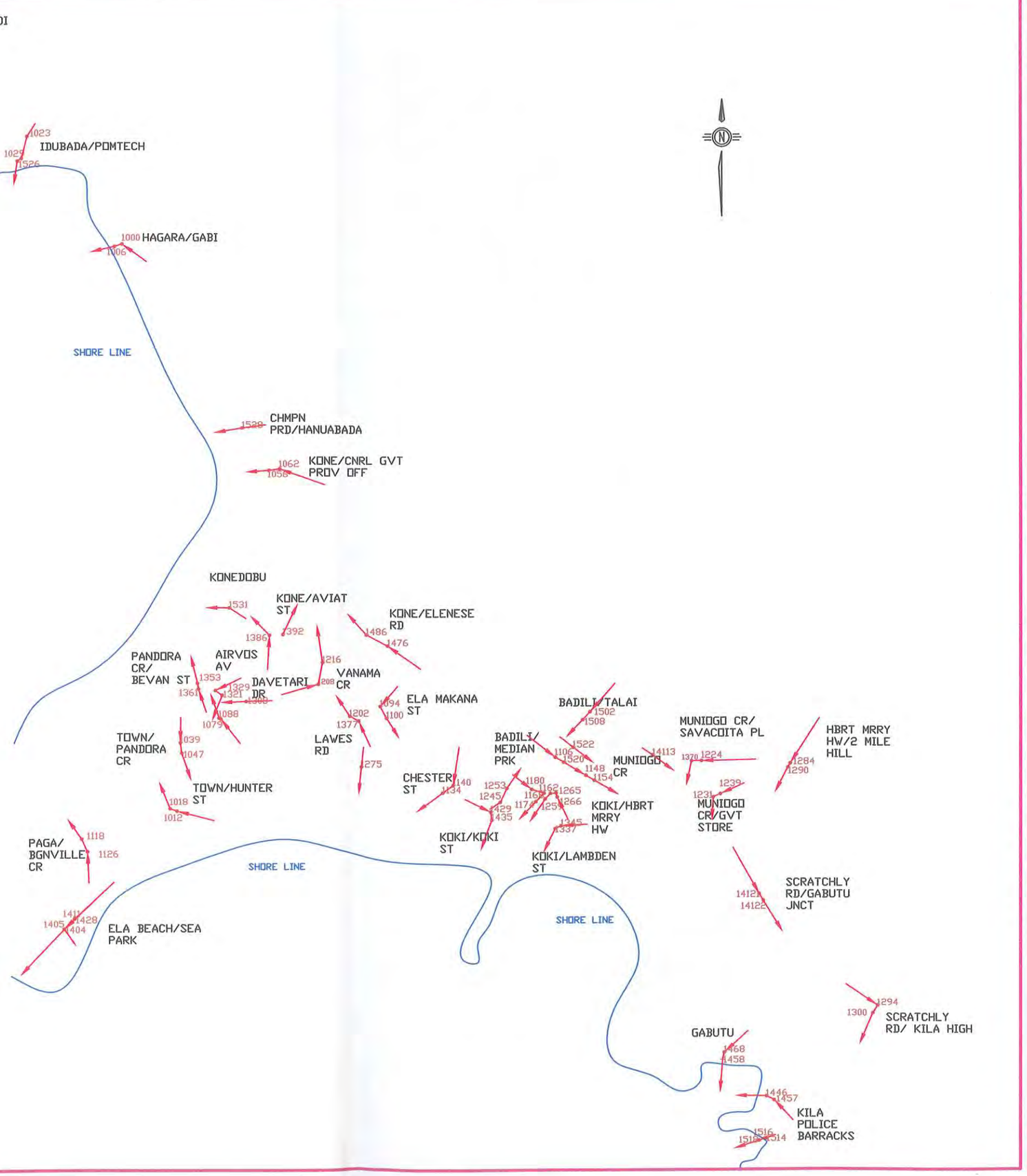
ASIA PACIFIC SURVEYS

Surveyors Town Planners & Mapping Consultant

Section 72 Lot 18 Madaha Street Gordons
PO Box 1271 Port Moresby
NCD Papua New Guinea
Tel (675) 325 6756 Fax (675) 325 6732
Email : aps@aps.com.pg

Reference

	PAGA GRID		CDW			
Point	EASTING	NORTHING	RL	Code	MH#	Location
1000	104763.022	107976.966	1.918	T/MH	M55509	Hagara/Gabi
1006	104720.657	107963.600	0.719	T/MH	M55508	Hagara/Gabi
1012	105071.835	104787.255	34.181	T/MH	M652D3	Town/Hunter St.
1018	105033.162	104800.646	31.793	T/MH	M652D2	Town/Hunter St.
1023	104233.623	108593.384	4.365	T/MH	M55502	Idubada/Pom Tech
1029	104201.875	108467.893	1.460	T/MH	M55501	Idubada/Pom Tech
1039	105090.248	105171.787	46.594	T/MH	M65293	Pandora Cres
1047	105097.772	105113.396	43.032	T/MH	M65292	Pandora Cres
1056	105590.839	106704.043	6.341	T/MH	M75417	Kone/Prov.Gvt Off.
1062	105650.967	106712.221	10.330	T/MH	M75416	Kone/Prov.Gvt Off.
1079	105319.376	105305.683	70.238	T/MH	M652A1	Airvos Avenue
1088	105309.567	105311.010	68.381	T/MH	M65299	Airvos Avenue
1094	106220.810	105374.085	89.197	T/MH	M752A6	Ela Makana
1100	106255.399	105307.969	88.755	T/MH	M752A5	Ela Makana
1106	107207.208	105083.898	30.971	T/MH	M85293	Badili/Median Park
1118	104541.311	104631.021	48.595	T/MH	M65208	Paga/Bougainville Cr
1126	104573.198	104559.620	54.731	T/MH	M65209	Paga/Bougainville Cr
1134	106572.249	104886.494	95.308	T/MH	M85233	Chester St.
1140	106631.800	104929.213	96.948	T/MH	M85234	Chester St.
1148	107377.199	104981.247	12.701	T/MH	M95231	Badili/Median Park
1154	107424.760	104953.319	11.751	T/MH	M95227	Badili/Median Park
1162	107181.231	104880.794	9.461	T/MH	M85263	Koki/Hbrt Mrry H/W
1168	107144.532	104881.904	7.817	T/MH	M85268	Koki/Hbrt Mrry H/W
1174	107099.030	104834.911	5.215	T/MH	M85267	Koki/Hbrt Mrry H/W
1180	107075.599	104904.138	7.899	T/MH	M85269	Koki/Hbrt Mrry H/W
1186	103690.666	109225.701	1.322	T/MH	M*****	Kanudi
1194	103805.970	109196.740	3.031	T/MH	M*****	Kanudi
1202	106045.172	105317.719	62.068	T/MH	M75285	Lawes Rd
1208	105868.234	105498.704	41.518	T/MH	M75272	Vanama Cres
1216	105890.986	105620.865	24.895	T/MH	M75304	Vanama Cres
1224	108024.414	105061.272	34.189	T/MH	M95278	Muniogo Cr/Savachta Pl
1231	108091.287	104857.689	23.003	T/MH	M95262	Muniogo Cr/Gvt.Store
1239	108131.446	104875.292	27.129	T/MH	M95263	Muniogo Cr/Gvt.Store
1245	106898.681	104833.081	10.357	T/MH	M85252	Koki/Koki St.
1253	106935.530	104910.794	11.883	T/MH	M85273	Koki/Koki St.
1259	107150.880	104849.543	7.749	T/MH	M85262	Koki/Hbrt Mrry H/W
1265	107210.896	104883.001	12.071	T/MH	M85264	Koki/Hbrt Mrry H/W
1266	107217.766	104860.006	16.251	T/MH	M85265	Koki/Hbrt Mrry H/W
1275	106113.553	105031.756	31.566	T/MH	M752D7	Lawes Rd
1284	108523.706	105045.510	81.914	T/MH	M05235	Hrbt Mrry H/W/2 mile hill
1290	108510.490	105022.413	74.626	T/MH	M05236	Hrbt Mrry H/W/2 mile hill
1294	109011.929	103681.308	15.063	T/MH	M05180	Scratchly Rd/Kila High
1300	108985.091	103637.967	14.311	T/MH	M05181	Scratchly Rd/Kila High
1308	105461.974	105403.182	113.531	T/MH	M75209	Davetari Dr.
1321	105325.676	105438.498	68.159	T/MH	M*****	Airvos Avenue
1329	105287.667	105465.856	70.314	T/MH	M*****	Airvos Avenue
1337	107207.367	104682.517	10.749	T/MH	M852B2	Koki/Lambden St.
1345	107239.171	104697.776	11.992	T/MH	M852B1	Koki/Lambden St.
1353	105186.802	105505.609	44.650	T/MH	M*****	Pandora Cr/Bevan St.
1361	105192.394	105474.037	43.700	T/MH	M*****	Pandora Cr/Bevan St.
1370	107968.398	105061.149	30.420	T/MH	M95277	Muniogo Cr/Savachta Pl
1377	106097.612	105290.007	63.789	T/MH	M75298	Lawes Rd
1386	105594.252	105775.621	31.815	T/MH	M75357	Awat St
1392	105669.186	105779.447	16.114	T/MH	M75344	Awat St
1404	104445.332	104121.176	1.482	T/MH	M65143	Ela Beach/Sea Park
1405	104444.255	104122.642	1.498	T/MH	M65131	Ela Beach/Sea Park
1411	104502.232	104181.345	1.290	T/MH	M65129	Ela Beach/Sea Park
1428	104503.330	104179.963	1.261	T/MH	M65144	Ela Beach/Sea Park
1429	106844.551	104777.721	6.917	T/MH	M85251	Koki/Le.Hunter/Koki St
1435	106850.225	104731.640	1.971	T/MH	M85253	Koki/Le.Hunter/Koki St
1446	108391.972	103170.466	10.897	T/MH	M05001	Kila Police Barracks
1457	108434.447	103147.809	14.997	T/MH	M05005	Kila Police Barracks
1458	108144.742	103376.052	3.502	T/PIT	Storm Water Pit	Gabutu
1468	108154.042	103415.562	6.288	T/MH	M95001	Gabutu
1476	106261.148	105713.882	15.453	T/MH	M753B2	Kone/Elenese Rd.
1486	106141.301	105776.570	12.494	T/MH	M753B1	Kone/Elenese Rd.
1502	107399.987	105339.693	32.449	T/MH	M95235	Badili/Talai Sttlmnt
1508	107358.883	105294.289	25.673	T/MH	M95236	Badili/Talai Sttlmnt
1514	108391.564	102929.432	1.542	T/MH	M*****	Kila Police Barracks
1516	108379.794	102926.592	0.915	T/MH	M*****	Kila Police Barracks
1518	108349.383	102916.912	-0.327	T/MH	M*****	Kila Police Barracks



Amendments

Associated Consultants

Client

JICA

Project

JICA Port Moresby Sewerage Project

Details

SEWERAGE MANHOLE Port Moresby

Scale	NTS		
Level Datum			
Origin			
Surveyed	KI	Date	MAY 2011
Computed	KI	Checked	APS_JM
Cood File	MANHOLE1	Acad File	MHPSTN1

ASIA PACIFIC SURVEYS
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Email : aps@aps.com.pg

Reference


ASIA-PACIFIC SURVEYS

PUMP STATION SURVEY REPORT

TABLE OF CONTENTS

Pump Station Survey Report

Konedobu Pump Station

Table of Contents

1.0 General

The Konedobu Pump Station is a fully functional Pump Station. The Information outlined below provides the results of the measurements made and conditions of the Pump Station according to the Checklist provided.

2.0 Pump Pit

2.1 Pump Pit Measurements:

a) Level of Pump Pit: -4.27m
b) Inside Diameter: 4020mm
c) Outside Diameter: 4350mm
d) Wall Thickness: 330mm
e) Slab Thickness: 300mm
f) Pit Depth: 6280mm
g) Slab Open Size: 1300mm X 3470mm

2.2 Pump Pit Leakage Condition

There are no visible leakages along the 3 Steel pressure pipes in the pump pit.
There is no visible sign of sea water entering.

2.3 Pump pit corrosion condition

The 3 Steel Pressure Pipes clearly shows corrosion or rust taking place. Opening a Steel Pressure pipe would be impossible due to the severe corrosion.

2.4 Pump Pit Crack condition

There is no cracks or steel work exposure in the pump walls.

3.0 Valve Pit

3.1 Valve Pit Measurements:

a) Inside Diameter: 1610mm X 2560mm
b) Outer Diameter: 2010mm X 3060mm
c) Wall Thickness: 250mm
d) Slab Thickness: 260mm
e) Pit Depth: 3250mm
f) Slab Open Size: 1610mm X 2560mm

3.2 Valve Pit Leakage Condition.

The Steel pressure pipes have no leakages.
There is no sign of sea water entering.

3.3 Valve Pit Corrosion condition

Most of the pressure pipes in the Valve pit are severely corroded.

3.4 Valve Pit crack condition

There are no cracks or steel works exposure.

4.0 Inflow Pipes

Pipe 1
Diameter: 150mm
Level: -2.12m
Material: PVC

Pipe 2
Diameter: 375mm
Level: -3.69m
Material: Steel

5.0 Outflow Pipe

Pipe 1
Diameter: 200mm
Level: 0.79m
Material: Steel Pipe

6.0 Manhole in front of one

Manhole 1 (Inflow Manhole)
Diameter: 1.30m
Level: -2.36m *(Bottom of Manhole)*
Material: Concrete

Manhole 2 (Inflow Manhole)
Diameter: 1.05m
Level: 9.01 *(Bottom of Manhole)*
Material: Concrete

Manhole 3 (Outflow Manhole)
Diameter: 700mm
Level: 0.72m *(Bottom of Manhole)*
Material: Concrete

7.0 Pressure Pipe

The route of flow is as shown in the Plan.
Diameter: 200mm
Material: Steel

8.0 Installation and Repair Resume

Installation Year is not known however it is no earlier than 1954 and no later than 1968.
See the Mechanical/Electrical Report.

9.0 Conclusion

To conclude, the Konedobu Pump Station is fully functional and is a large pumps station compared to others. However, most of the steel pipe works within the pump station is corroded.

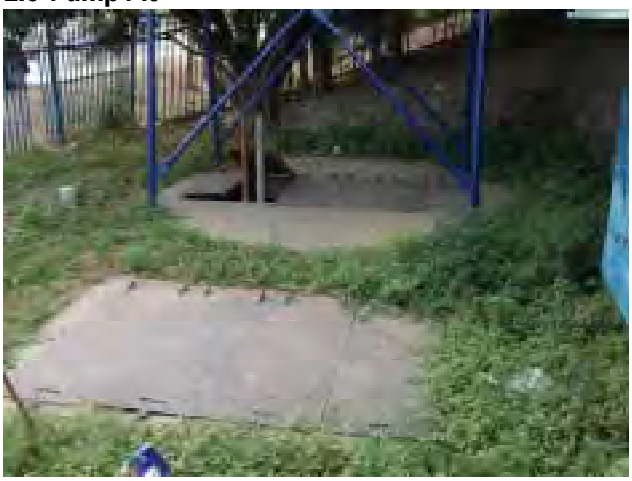
KONEDOBU PUMP STATION *Surveyed:18/03/2011*

Existing Item	Investigation Item	Work Form	Results/Contents				Photo
Pump Yard	Place of Facilities	Sketch	Drawing				☐ Photo1a
Pump Pit	Level of a Pump Pit	Apparatus Measurement	-4.27m				
	Inside Diameter	Apparatus Measurement	3650mm				
	Outer Diameter	Apparatus Measurement	4350mm				
	Wall Thickness	Apparatus Measurement	330mm				
	Slab Thickness	Apparatus Measurement	300mm				
	Pit Depth	Apparatus Measurement	6280mm				
	Slab Open Size	Apparatus Measurement	1300mm X 3470mm				
	Existence of Leakage	Visual Investigation	not many				☐ Photo 1b
	Can Check Place of Leakage?	Visual Investigation	yes				☐ Photo 1c
	Is the Place of Leakage of Water Photoed?	Visual Investigation	no				☐
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	not many				☐ Photo 1c &1d
	Did Took the Photograph of the Severest situation?	Visual Investigation	Yes				☐ Photo 1e
	Are There Many Cracks?	Visual Investigation	not many				☐ Photo 1f
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no				☐
Valve Pit	Inside Diameter	Apparatus Measurement	1610mm X 2560mm				
	Outer Diameter	Apparatus Measurement	2010mm X 3060mm				
	Wall Thickness	Apparatus Measurement	250mm				
	Slab Thickness	Apparatus Measurement	260mm				
	Pit Depth	Apparatus Measurement	3250mm				
	Slab Open Size	Apparatus Measurement	1610mm X 2560mm				
	Existence of Leakage	Visual Investigation	not many				☐ Photo 2a
	Can Check the place of Leakage?	Visual Investigation	yes				☐ Photo 2a
	Is the Place of Leakage of Water Photoed?	Visual Investigation	yes				☐ Photo 2a
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	many				☐ Photo 2b
	Did Took the Photograph of the Severest situation?	Visual Investigation	yes				☐ Photo 2c
	Are There Many Cracks?	Visual Investigation	not many				☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no				☐
Inflow Pipe	Number	Visual Investigation	No. 1	No. 2	No. 3		☐ Photo 3a & 1f
	Diameter	Apparatus Measurement	150mm	375mm			
	Level	Apparatus Measurement	-2.12m	-3.69m			
	Material	Visual Investigation	PVC	Steel			
Outflow Pipe	Number	Visual Investigation	No. 1	No. 2			☐ Photo 4a
	Diameter	Apparatus Measurement	200mm				
	Level	Apparatus Measurement	0.79m				
	Material	Visual Investigation	Steel Pipe				
Manhole infront of one	Number	Visual Investigation	No. 1	No. 2	No. 3		☐ Photo 5a, 5b & 5c
	Diameter	Apparatus Measurement	1.30m	1.05mm	700mm		
	Level	Apparatus Measurement	-2.36m	9.01m	0.72m		
	Material	Visual Investigation	Concrete	Concrete	Concrete		
Pressure Pipe	Route	Data Collection and listening Investigation	Drawing				
	Diameter	Data Collection and listening Investigation	200mm				
	Material	Data Collection and listening Investigation	Steel Pipe				
Installation Year		Data Collection and listening Investigation	no earlier 1954 and no later than 1968				
Repair Resume		Data Collection and listening Investigation	no				

Existing Item	Investigation Item	Work Form	Contents	Photo
Mechanical Facilities of Pump Station				
Pump	Is the Rust of a Pump Severe?	Visual Investigation	many / medium / not many	
	The Leakage of the Liquid from a Valve etc…	Visual Investigation		
		(The source Material which can check a position)		
	The allophone at the time of a drive.			
	Pumping Equipment…			
	Pump Specifications	Data Collection and listening Investigation	yes / no	
	Manufacturer	Data Collection and listening Investigation		
	Pump Type	Data Collection and listening Investigation		
	Pump Diameter	Data Collection and listening Investigation		
	Power	Data Collection and listening Investigation		
	Design Flow	Data Collection and listening Investigation		
	Head	Data Collection and listening Investigation		
	Charactersitic Curve of Pump	Data Collection and listening Investigation	yes / no	
	Pump Efficiency	Data Collection and listening Investigation	yes / no	
	Capacity of Pumping Facility	Data Collection and listening Investigation	yes / no	
	Installation Year	Data Collection and listening Investigation		
	Repair Resume	Data Collection and listening Investigation	yes / no	
	The Secured situation of replacement parts.	Data Collection and listening Investigation	yes / no	
Valve	Is the rust of a Valve Severe?	Visual Investigation	many / medium / not many	
	The leakage of the liquid from a valve etc…	(The source Material which can check a position)	many / medium / not many	
	Valve Type	Data Collection and listening Investigation		
	Valve Diameter	Data Collection and listening Investigation		
Electrical facilities of pump stations.				
Control Board	size	Apparatus Measurement		
	Base size	Apparatus Measurement		
	Is the rust of a pump severe?	Visual Investigation	many / medium / not many	
	Electrical facilities specifications	Data Collection and Listening Investigation		
	Installation Year	Data Collection and Listening Investigation	yes / no	
	Repair Resume	Data Collection and Listening Investigation	yes / no	

Konedobu Pump Stations Photographs

1.0 Pump Pit



1a) Place of Facilities

1b. Pump Pit Leakage Check; Not many leakages

1c. Leakage Check and Corrosion check; not many leakages however corrosion is severe

1d. Severe Place of Corrosion; Inflow pipe and pressure pipes

1e. Pressure Pipes are corroding like this one.

1f. Crack; Not many cracks

2.0 Valve Pit

2a. Leakage Check; not many

2b. Exposure of Steel and Corrosion

2c. Most steel pipes are severely corroded like this one.

3.0 Inflow Pipes

3a. Inflow Pipe 1 Top, PVC; Inflow Pipe 2 Bottom, Steel

4.0 Outflow Pipe

4a. Outflow Pipe

5.0 Manhole in front of one

5a. Manhole 1, Inflow manhole

5b. Manhole 2, Inflow Manhole

5c. Manhole 3, Outflow Manhole

Pump Station Survey Report

Old Yacht Club Pump Station

Table of Contents

1.0 General

The Old Yacht Club Pump Station has been identified as a faulty pump Station. It was not operating effectively when survey work commenced on it. The Pump Pit was blocked to almost the surface when visited at that time, thus an alternate pump was used to pump the blockage to flow through before survey work commenced on it, however when pumped water level couldn't drop to the floor of the pump pit, in addition one of the two pressure pipes in the pump pit is missing (*See Photo 1b).* The Information outlined below provides the results of the measurements made and conditions of the Pump Station according to the Checklist provided.

2.0 Pump Pit

2.1 Pump Pit Measurements:

a) Level of Pump Pit: -1.58m
b) Inside Diameter: 1880mm
c) Outside Diameter: 2280mm
d) Wall Thickness: 200mm
e) Slab Thickness: 320mm
f) Pit Depth: 3280mm
g) Slab Open Size: 770mm X 1260mm

2.2 Pump Pit Leakage Condition

There were not many leakages along the only pressure pipe that is operating. However it is impossible to comment on the area below the blockage as it is not visible.
There are no visible signs of salt water entering the pit.

2.3 Pump Pit Corrosion condition

The Steel Pressure Pipes clearly shows corrosion.

2.4 Pump pit Crack condition

No cracks or steel works are exposed.

3.0 Valve Pit

3.1 Valve Pit Measurements:

a) Inside Diameter: 1180mm X 1480mm
b) Outer Diameter: 1680mm X 1680mm
c) Wall Thickness: 200mm
d) Slab Thickness: 210mm
e) Pit Depth: 1520mm
f) Slab Open Size: 900mm X 1260mm

3.2 Valve Pit Leakage Condition.

One of the pressure pipes in the valve pit has leakage on it, for that same pipe part of it in the pump pit has been broken off. *(See Photo 1b and 2a)*

3.3 Valve Pit Corrosion condition

Most of the pressure pipe in the Valve pit is severely corroded.

3.4 Valve Pit crack condition

No cracks are visible in the valve pit. There is no exposed steel work.

4.0 Inflow Pipe

Pipe 1
Diameter: 150mm
Level: -0.15m
Material: Steel Pipe

Pipe 2
Diameter: 150mm
Level: -1.32m
Material: Steel Pipe

5.0 Outflow Pipe

Pipe 1
Diameter: 100mm
Level: 0.98m
Material: Steel Pipe

6.0 Manhole in front of one

Manhole 1
Diameter: 1.21m
Level: -0.49m *(Bottom of Manhole)*
Material: Concrete

7.0 Pressure Pipe

The route of flow is as shown in the Pit Section Diagram.
Diameter: 130mm
Material: Steel

8.0 Installation and Repair Resume

Installation Year is not known. However it is no earlier than 1954 and no later than1968.
See the Mechanical/Electrical Report.

9.0 Conclusion

To conclude, the Old Yacht Club Pump Station is one of the older Pump Stations. Most of the pipe works are corroded.

OLD YACHT CLUB PUMP STATION *Surveyed: 04/04/2011*

Existing Item	Investigation Item	Work Form	Contents/Results			Photo
Pump Yard	Place of Facilities	Sketch	Drawing			☐ Photo 1a
Pump Pit	Level of a Pump Pit	Apparatus Measurement	-1.58m			
	Inside Diameter	Apparatus Measurement	1880mm			
	Outer Diameter	Apparatus Measurement	2280mm			
	Wall Thickness	Apparatus Measurement	200mm			
	Slab Thickness	Apparatus Measurement	320mm			
	Pit Depth	Apparatus Measurement	3280mm			
	Slab Open Size	Apparatus Measurement	770mm X 1260mm			
	Existence of Leakage	Visual Investigation	not many			☐
	Can Check Place of Leakage?	Visual Investigation	Yes			☐ Photo 1b
	Is the Place of Leakage of Water Photoed?	Visual Investigation	no			☐
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	not many			☐ Photo 1c
	Did Took the Photograph of the Severest situation?	Visual Investigation	Yes			☐ Photo 1c
	Are There Many Cracks?	Visual Investigation	not many			☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no			☐
Valve Pit	Inside Diameter	Apparatus Measurement	1180mm X 1480mm			
	Outer Diameter	Apparatus Measurement	1680mm X 1680mm			
	Wall Thickness	Apparatus Measurement	200mm			
	Slab Thickness	Apparatus Measurement	210mm			
	Pit Depth	Apparatus Measurement	1520mm			
	Slab Open Size	Apparatus Measurement	900mm X 1260mm			
	Existence of Leakage	Visual Investigation	not many			☐ Photo 2a
	Can Check the place of Leakage?	Visual Investigation	yes			☐ Photo 2a
	Is the Place of Leakage of Water Photoed?	Visual Investigation	yes			☐ Photo 2a
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	not many			☐ Photo 2b
	Did Took the Photograph of the Severest situation?	Visual Investigation	yes			☐ Photo 2b
	Are There Many Cracks?	Visual Investigation	not many			☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no			☐
Inflow Pipe	Number	Visual Investigation	No. 1	No. 2	No. 3	☐ Photo 3a & 3b
	Diameter	Apparatus Measurement	150mm	150mm		
	Level	Apparatus Measurement	-0.15m	-1.32m		
	Material	Visual Investigation	Steel Pipe	Steel Pipe		
Outflow Pipe	Number	Visual Investigation	No. 1	No. 2		☐ Photo 3c
	Diameter	Apparatus Measurement	100mm			
	Level	Apparatus Measurement	0.98m			
	Material	Visual Investigation	Steel Pipe			
Manhole infront of one	Number	Visual Investigation	No. 1	No. 2	No. 3	☐ Photo 4a
	Diameter	Apparatus Measurement	1.21m			
	Level	Apparatus Measurement	-0.49m *(bottom of manhole)*			
	Material	Visual Investigation	Concrete			
Pressure Pipe	Route	Data Collection and listening Investigation	Drawing			
	Diameter	Data Collection and listening Investigation	130mm			
	Material	Data Collection and listening Investigation	Steel			
Installation Year		Data Collection and listening Investigation	*****			
Repair Resume		Data Collection and listening Investigation	no			

Existing Item	Investigation Item	Work Form	Contents	Photo
Mechanical Facilities of Pump Station				
Pump	Is the Rust of a Pump Severe?	Visual Investigation	many / medium / not many	
	The Leakage of the Liquid from a Valve etc…	Visual Investigation		
		(The source Material which can check a position)		
	The allophone at the time of a drive.			
	Pumping Equipment…			
	Pump Specifications	Data Collection and listening Investigation	yes / no	
	Manufacturer	Data Collection and listening Investigation		
	Pump Type	Data Collection and listening Investigation		
	Pump Diameter	Data Collection and listening Investigation		
	Power	Data Collection and listening Investigation		
	Design Flow	Data Collection and listening Investigation		
	Head	Data Collection and listening Investigation		
	Charactersitic Curve of Pump	Data Collection and listening Investigation	yes / no	
	Pump Efficiency	Data Collection and listening Investigation	yes / no	
	Capacity of Pumping Facility	Data Collection and listening Investigation	yes / no	
	Installation Year	Data Collection and listening Investigation		
	Repair Resume	Data Collection and listening Investigation	yes / no	
	The Secured situation of replacement parts.	Data Collection and listening Investigation	yes / no	
Valve	Is the rust of a Valve Severe?	Visual Investigation	many / medium / not many	
	The leakage of the liquid from a valve etc…	(The source Material which can check a position)	many / medium / not many	
	Valve Type	Data Collection and listening Investigation		
	Valve Diameter	Data Collection and listening Investigation		
Electrical facilities of pump stations.				
Control Board	size	Apparatus Measurement		
	Base size	Apparatus Measurement		
	Is the rust of a pump severe?	Visual Investigation	many / medium / not many	
	Electrical facilities specifications	Data Collection and Listening Investigation		
	Installation Year	Data Collection and Listening Investigation	yes / no	
	Repair Resume	Data Collection and Listening Investigation	yes / no	

Old Yacht Club Pump Station Photographs

1.0 Pump Pit

1a. Place of Facility

1b: Pump Pit Leakage Check; not many leakages

1c: Steel Rod Exposed; Most Steel Pressure Pipes are rusting

2.0 Valve Pit

2a. Existence of Leakage

2b. Steel Rod Exposed

3.0 Inflow Pipe and Outflow Pipes

3a. Inflow Pipe 1

3b. Inflow Pipe 2

3c. Outflow Pipe

4.0 Manhole In front of one

4a. Inflow Manhole

Pump Station Survey Report

Stanley Esplanade Pump Station

Table of Contents

1.0 General

The Stanley Esplanade pump station was blocked due to its faulty pump when survey work was about to commence. An alternate pump was used to pump the blockage to flow through before measurements and investigations on the conditions of the pump station were made. The Information outlined below provides the results of the measurements made and conditions of the Pump Station according to the Checklist provided.

2.0 Pump Pit

2.1 Pump Pit Measurements:

a) Level of Pump Pit: -3.38m
b) Inside Diameter: 3150mm
c) Outside Diameter: 4250mm
d) Wall Thickness: 550mm
e) Slab Thickness: 530mm
f) Pit Depth: 4825mm
g) Slab Open Size: 3470mm X 1340mm

2.2 Pump Pit Leakage Condition

There are not many leakages along the pressure pipes.

2.3 Pump Pit Corrosion condition

The Steel Pressure Pipes clearly shows corrosion or rust taking place.

2.4 Pump pit Crack condition

No cracks are visible on the Pump Pit concrete walls.

3.0 Valve Pit

3.1 Valve Pit Measurements:

a) Inside Diameter: 1860mm X 2560mm
b) Outer Diameter: 2300mm X 3000mm
c) Wall Thickness: 220mm
d) Slab Thickness: 180mm
e) Pit Depth: 1500mm
f) Slab Open Size: 1560mm X 2360mm

3.2 Valve Pit Leakage Condition.

There are no leakages however there is a broken pipe. *(See photo 2b)*

3.3 Valve Pit Corrosion condition

Most of the pressure pipes in the Valve pit are corroded.

3.4 Valve Pit crack condition

No cracks are visible in the valve pit.

4.0 Inflow Pipe

Pipe 1
Diameter: 400mm
Level: -1.10m
Material: Steel Pipe

Pipe 2
Diameter: 200mm
Level: -0.51m
Material: PVC

5.0 Outflow Pipe

Pipe 1
Diameter: 400mm
Level: -1.08m
Material: Steel Pipe

6.0 Manhole in front of one

Manhole 1	Manhole 2	Manhole 3
Diameter: 1.050m	Diameter: 1.070m	Diameter: 1.050m
Level: 0.08m	Level: -0.87m	Level: 0.48m
Material: Concrete	Material: Concrete	Material: Concrete

7.0 Pressure Pipe

The route of flow is as shown in the Pit Section Diagram.
Diameter: 200mm
Material: Steel Pipe

8.0 Installation and Repair Resume

Installation Year is not known however it is assumed to be in the early 70s and late 60s.
There is no repair resumption yet on the pump station.

9.0 Conclusion

To conclude, the Stanley Esplanade Pump Station is blocked due to its faulty pump. The Pump pit and the valve pit do not have many leakages and cracks except for corrosion which occurs on the pressure pipes and steel works.

STANLEY ESPLANADE PUMP STATION *Surveyed: 22/03/2011*

Existing Item	Investigation Item	Work Form	Contents/Results			Photo
Pump Yard	Place of Facilities	Sketch	Drawing			☐
Pump Pit	Level of a Pump Pit	Apparatus Measurement	-3.38m			
	Inside Diameter	Apparatus Measurement	3150mm			
	Outer Diameter	Apparatus Measurement	4250mm			
	Wall Thickness	Apparatus Measurement	550mm			
	Slab Thickness	Apparatus Measurement	530mm			
	Pit Depth	Apparatus Measurement	4825mm			
	Slab Open Size	Apparatus Measurement	3470mm X 1340mm			
	Existence of Leakage	Visual Investigation	not many			☐
	Can Check Place of Leakage?	Visual Investigation	yes			☐
	Is the Place of Leakage of Water Photoed?	Visual Investigation	yes			☐ Photo 1a
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	yes			☐ Photo 1b
	Did Took the Photograph of the Severest situation?	Visual Investigation	yes			☐ Photo 1b
	Are There Many Cracks?	Visual Investigation	no			☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no			☐ Photo 1c & 1e
Valve Pit	Inside Diameter	Apparatus Measurement	1860mm X 2560mm			
	Outer Diameter	Apparatus Measurement	2300mm X 3000mm			
	Wall Thickness	Apparatus Measurement	220mm			
	Slab Thickness	Apparatus Measurement	180mm			
	Pit Depth	Apparatus Measurement	1500mm			
	Slab Open Size	Apparatus Measurement	1560mm X 2360mm			
	Existence of Leakage	Visual Investigation	not many			☐
	Can Check the place of Leakage?	Visual Investigation	yes			☐
	Is the Place of Leakage of Water Photoed?	Visual Investigation	yes			☐ Photo 2a
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	medium			
	Did Took the Photograph of the Severest situation?	Visual Investigation	yes			☐ Photo 2a
	Are There Many Cracks?	Visual Investigation	not many			☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	not			☐
						☐
Inflow Pipe	Number	Visual Investigation	No. 1	No. 2	No. 3	☐ Photo 3a & 3b
	Diameter	Apparatus Measurement	400mm	200mm		
	Level	Apparatus Measurement	-1.10m	-0.51m		
	Material	Visual Investigation	Steel Pipe	PVC		
Outflow Pipe	Number	Visual Investigation	No. 1	No. 2		☐ Photo 3b
	Diameter	Apparatus Measurement	400mm			
	Level	Apparatus Measurement	-1.08m			
	Material	Visual Investigation	Steel Pipe			
Manhole infront of one	Number	Visual Investigation	No. 1	No. 2	No. 3	☐ Photo 4a, 4b & 4c
	Diameter	Apparatus Measurement	1.050m	1.070m	1.050m	
	Level	Apparatus Measurement	0.08m	-0.87m	0.48m	
	Material	Visual Investigation	Concrete	Concrete	Concrete	
Pressure Pipe	Route	Data Collection and listening Investigation	Drawing			
	Diameter	Data Collection and listening Investigation	200mm			
	Material	Data Collection and listening Investigation	Steel			
Installation Year		Data Collection and listening Investigation	*****			
Repair Resume		Data Collection and listening Investigation	no			

Existing Item	Investigation Item	Work Form	Contents	Photo
Mechanical Facilities of Pump Station				
Pump	Is the Rust of a Pump Severe?	Visual Investigation	many / medium / not many	
	The Leakage of the Liquid from a Valve etc…	Visual Investigation		
		(The source Material which can check a position)		
	The allophone at the time of a drive.			
	Pumping Equipment…			
	Pump Specifications	Data Collection and listening Investigation	yes / no	
	Manufacturer	Data Collection and listening Investigation		
	Pump Type	Data Collection and listening Investigation		
	Pump Diameter	Data Collection and listening Investigation		
	Power	Data Collection and listening Investigation		
	Design Flow	Data Collection and listening Investigation		
	Head	Data Collection and listening Investigation		
	Charactersitic Curve of Pump	Data Collection and listening Investigation	yes / no	
	Pump Efficiency	Data Collection and listening Investigation	yes / no	
	Capacity of Pumping Facility	Data Collection and listening Investigation	yes / no	
	Installation Year	Data Collection and listening Investigation		
	Repair Resume	Data Collection and listening Investigation	yes / no	
	The Secured situation of replacement parts.	Data Collection and listening Investigation	yes / no	
Valve	Is the rust of a Valve Severe?	Visual Investigation	many / medium / not many	
	The leakage of the liquid from a valve etc…	(The source Material which can check a position)	many / medium / not many	
	Valve Type	Data Collection and listening Investigation		
	Valve Diameter	Data Collection and listening Investigation		
Electrical facilities of pump stations.				
Control Board	size	Apparatus Measurement		
	Base size	Apparatus Measurement		
	Is the rust of a pump severe?	Visual Investigation	many / medium / not many	
	Electrical facilities specifications	Data Collection and Listening Investigation		
	Installation Year	Data Collection and Listening Investigation	yes / no	
	Repair Resume	Data Collection and Listening Investigation	yes / no	

Stanley Esplanade Pump Station Photographs

1.0 Pump Pit

1a. Leakage Condition; not many leakages along the pressure pipes

1b.Corrosion Condition; medium level of corrosion occurring on steel pressure pipes

1c. Crack condition; There are no cracks.

1e. Crack Condition; There are no cracks, (opposite side)

2.0 Valve Pit

2a. Leakage condition; not many leakages, Corrosion condition; There is medium level of corrosion. Crack condition; no cracks.

2b. Broken pressure pipe in valve pit. This pipe is the 3rd pipe from left.

3.0 Inflow Pipe and Outflow Pipe

3a. Inflow pipe 1

3b. Inflow pipe 2 is at the top, outflow pipe is at the bottom.

4.0 Manhole in front of one

4a. Manhole 1, Inflow Manhole

4b. Manhole 2, Outflow Manhole

4c. Manhole 3, Inflow Manhole

Pump Station Survey Report

Sea Park Pump Station

Table of Contents

1.0 General

The sea park pump Station is the largest pump station pumping sewerage out of to the sea park outfall. The Information outlined below provides the results of the measurements made and conditions of the Pump Station according to the Checklist provided.

2.0 Pump Pit

2.1 Pump Pit Measurements:

a) Level of Pump Pit: -4.12m
b) Inside Diameter: 3500mm X 7030mm
c) Outside Diameter: 4060mm X 7590
d) Wall Thickness: 280mm
e) Slab Thickness: 280mm
f) Pit Depth: 6.01m (Average)
g) Slab Open Size: 970mm X 1610mm & 970mm X 1590mm

2.2 Pump Pit Leakage Condition

There are no leakages.

2.3 Pump Pit Corrosion condition

There is medium level of correction.

2.4 Pump pit Crack condition

There are no cracks.

3.0 Valve Pit

3.1 Valve Pit Measurements:

a) Inside Diameter: 1910mm X 6980mm
b) Outer Diameter: 2150mm X 7220mm
c) Wall Thickness: 280mm
d) Slab Thickness: 240mm
e) Pit Depth: 2700mm
f) Slab Open Size: 960mm X 1460mm & 960mm X 1460mm

3.2 Valve Pit Leakage Condition.

There is no leakage in the Valve Pit

3.3 Valve Pit Corrosion condition

There is no severe corrosion in the valve pit steel works.

3.4 Valve Pit crack condition

There are no cracks in the valve pit.

4.0 Inflow Pipe

Pipe 1
Diameter: 600mm
Level: -0.40m
Material: Steel Pipe

Pipe 2: 3 Concrete rectangular pipes
Diameter: 340mm X 440mm
Level: -1.74m
Material: Concrete

5.0 Outflow Pipe

There are no Outflow pipes in the Pump pit, Overflow reverses in the 3 rectangular inlet pipes.

6.0 Manhole in front of one

Manhole
Diameter: 1.08m
Level: -0.96m *(Bottom of Manhole)*
Material: Concrete

7.0 Pressure Pipe

The route of flow is as shown in the Pit Section Diagram.
Diameter: 350 mm
Material: Steel

8.0 Installation and Repair Resume

Exact Installation Year is not known. However it was installed in the late 6o's and early 70's.

9.0 Conclusion

To conclude, the Sea Park Pump Station is fully operational and pumps sewerage out to the sea park outfall.

SEA PARK PUMP STATION *Surveyed: 08/04/11*

Existing Item	Investigation Item	Work Form	Contents/Results		Photo
Pump Yard	Place of Facilities	Sketch	Drawing		☐1a,1b,1c,1d,1e,1f
Pump Pit	Level of a Pump Pit	Apparatus Measurement	-5.79m		
	Inside Diameter	Apparatus Measurement	4000mm X 4000mm (Approx.)		
	Outer Diameter	Apparatus Measurement	4280mm X 7600mmm		
	Wall Thickness	Apparatus Measurement	280mm		
	Slab Thickness	Apparatus Measurement	280mm		
	Pit Depth	Apparatus Measurement	7700m		
	Slab Open Size	Apparatus Measurement	970mm X 1610mm & 970mm X 1590mm		
	Existence of Leakage	Visual Investigation	Not many		☐
	Can Check Place of Leakage?	Visual Investigation	No		☐
	Is the Place of Leakage of Water Photoed?	Visual Investigation	No		☐
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	Not many		☐
	Did Took the Photograph of the Severest situation?	Visual Investigation	No		☐
	Are There Many Cracks?	Visual Investigation	Not many		☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	No		☐
Valve Pit	Inside Diameter	Apparatus Measurement	1220mm X 1260mm & 1220mm X 1260mm		
	Outer Diameter	Apparatus Measurement	3100mm		
	Wall Thickness	Apparatus Measurement	240mm		
	Slab Thickness	Apparatus Measurement	240mm		
	Pit Depth	Apparatus Measurement	2.70m		
	Slab Open Size	Apparatus Measurement	960mm X 1460mm & 960mm X 1460mm		
	Existence of Leakage	Visual Investigation	Not many		☐ Photo 2b
	Can Check the place of Leakage?	Visual Investigation	no		☐
	Is the Place of Leakage of Water Photoed?	Visual Investigation	no		☐
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	Not many		☐ Photo 2b
	Did Took the Photograph of the Severest situation?	Visual Investigation	no		☐
	Are There Many Cracks?	Visual Investigation	Not many		☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no		☐
Inflow Pipe	Number	Visual Investigation	No. 1	No. 2 No. 3	☐ Photo 3a & 1f
	Diameter	Apparatus Measurement	600mm	400mmX400mm	
	Level	Apparatus Measurement	-0.40m	1.74m	
	Material	Visual Investigation	Steel	Concrete	
				**X3 Pipes	
Outflow Pipe	Number	Visual Investigation	No. 1	No. 2	☐
	Diameter	Apparatus Measurement			
	Level	Apparatus Measurement			
	Material	Visual Investigation			
Manhole infront of one	Number	Visual Investigation	No. 1	No. 2 No. 3	☐ Photo 4a & 4b
	Diameter	Apparatus Measurement	1.08m		
	Level	Apparatus Measurement	-0.96m		
	Material	Visual Investigation	Concrete		
Pressure Pipe	Route	Data Collection and listening Investigation	Drawing		
	Diameter	Data Collection and listening Investigation	400mm		
	Material	Data Collection and listening Investigation	Steel		
Installation Year		Data Collection and listening Investigation	*****		
Repair Resume		Data Collection and listening Investigation	no		

Existing Item	Investigation Item	Work Form	Contents	Photo
Mechanical Facilities of Pump Station				
Pump	Is the Rust of a Pump Severe?	Visual Investigation	many / medium / not many	
	The Leakage of the Liquid from a Valve etc…	Visual Investigation		
		(The source Material which can check a position)		
	The allophone at the time of a drive.			
	Pumping Equipment…			
	Pump Specifications	Data Collection and listening Investigation	yes / no	
	Manufacturer	Data Collection and listening Investigation		
	Pump Type	Data Collection and listening Investigation		
	Pump Diameter	Data Collection and listening Investigation		
	Power	Data Collection and listening Investigation		
	Design Flow	Data Collection and listening Investigation		
	Head	Data Collection and listening Investigation		
	Charactersitic Curve of Pump	Data Collection and listening Investigation	yes / no	
	Pump Efficiency	Data Collection and listening Investigation	yes / no	
	Capacity of Pumping Facility	Data Collection and listening Investigation	yes / no	
	Installation Year	Data Collection and listening Investigation		
	Repair Resume	Data Collection and listening Investigation	yes / no	
	The Secured situation of replacement parts.	Data Collection and listening Investigation	yes / no	
Valve	Is the rust of a Valve Severe?	Visual Investigation	many / medium / not many	
	The leakage of the liquid from a valve etc…	(The source Material which can check a position)	many / medium / not many	
	Valve Type	Data Collection and listening Investigation		
	Valve Diameter	Data Collection and listening Investigation		
Electrical facilities of pump stations.				
Control Board	size	Apparatus Measurement		
	Base size	Apparatus Measurement		
	Is the rust of a pump severe?	Visual Investigation	many / medium / not many	
	Electrical facilities specifications	Data Collection and Listening Investigation		
	Installation Year	Data Collection and Listening Investigation	yes / no	
	Repair Resume	Data Collection and Listening Investigation	yes / no	

Sea Park Pump Station Photographs

1.0 Pump Pit

1a. Place of facility

1b. Inside pump house

1c.Flow concrete Structure

1d. Flow concrete structure & Old Mechanical Facility

1e. Flow concrete structure & Old mechanical facility

1f. Flow concrete structure; 3 inlets are to the left.

1g. 3 X Rectangular Inlet pipes (Diameter: 340mm X 440mm)

1h. Inside of Pump Pit

1f. Inside of pump

pit

1g. Pump pit Slab Opening, Background is the Ventilation Pipe (Dia. 300mm)

1h. Pressure

Pipes 

1i. Pump
Pit

1j. Pump Pit Leakage Condition; no
leakages

1k. Corrosion Condition; medium level of corrosion

1l. Crack condition; no cracks

1m. Crack condition; no
cracks,

2.0 Valve Pit

2a. Valve Pit

2b. Leakage condition; no leakages

2c. Corrosion Condition; not much corrosion

2d. Crack condition; no cracks

3.0 Inflow Pipe

3a. Inflow Pipe (600mm Diameter)

4.0 Manhole in front of one

4a.Infow Manhole 1

4b. Inflow manhole
1

Pump Station Survey Report

Davara Pump Station

Table of Contents

Pump Station Survey Report

1.0 General

The Davara, Ela Beach Pump Station is fully operational. The Information outlined below provides the results of the measurements and findings on the conditions of the pump pit and valve pit of the pump station according to the Checklist provided.

2.0 Pump Pit

2.1 Pump Pit Measurements:

a) Level of Pump Pit: -3.19m
b) Inside Diameter: 3750mm
c) Outside Diameter: 4300mm
d) Wall Thickness: 300mm
e) Slab Thickness: 530mm
f) Pit Depth: 4500mm
g) Slab Open Size: 1300mm X 3460mm

2.2 Pump Pit Leakage Condition

There is a leakage at one of the pipes (Pipe 3).

2.3 Pump Pit Corrosion condition

The Steel Pressure Pipes clearly shows corrosion or rust taking place as it is very close to the shoreline. Opening a Steel Pressure pipe would be impossible due to the severe corrosion.

2.4 Pump pit Crack condition

There are small cracks on the concrete walls of the pump pit.

3.0 Valve Pit

3.1 Valve Pit Measurements:

a) Inside Diameter: 1780mm X 2770mm
b) Outer Diameter: 1670mm X 2570mm
c) Wall Thickness: 390mm
d) Slab Thickness: 180mm
e) Pit Depth: 1500mm
f) Slab Open Size: 1670mm X 2570mm

3.2 Valve Pit Leakage Condition.

There are no leakages in the Valve pit.

3.3 Valve Pit Corrosion condition

The pressure pipes in the Valve pit are severely corroded.

3.4 Valve Pit crack condition

There are no cracks in the valve pit concrete walls.

4.0 Inflow Pipe

Pipe 1
Diameter: 370mm
Level: -1.44m
Material: Steel Pipe

5.0 Outflow Pipe

Pipe 1
Diameter: 350mm
Level: 0.26m
Material: Stee/ Pipe

6.0 Manhole in front of one

Manhole 1, Inflow Manhole
Diameter: 1.07m
Level: 0.97m
Material: Concrete

Manhole 2, Inflow Manhole
Diameter: 1.08m
Level: 1.97m
Material: Concrete

Manhole 3, Outflow Manhole
Diameter: 1.05m
Level: -1.72m
Material: Concrete

7.0 Pressure Pipe

The route of flow is as shown in the Pit Section Diagram.
Diameter: 200mm
Material: Steel

8.0 Installation and Repair Resume

Installation Year is not known however it is assumed to be in the early 70s and late 60s.
There is no repair resumption yet on the pump station.

9.0 Conclusion

This Pump Station is fully operational however the steel pipes within the pump it and the valve pit are severely corroded, in addition small cracks are visible on the pump pit concrete walls.

DAVARA, ELA BEACH PUMP STATION *Surveyed: 21/03/2011*

Existing Item	Investigation Item	Work Form	Contents/Results				Photo
Pump Yard	Place of Facilities	Sketch	Drawing				☐ Photo 1a
Pump Pit	Level of a Pump Pit	Apparatus Measurement	-3.19m				
	Inside Diameter	Apparatus Measurement	3750mm				
	Outer Diameter	Apparatus Measurement	4300mm				
	Wall Thickness	Apparatus Measurement	300mm				
	Slab Thickness	Apparatus Measurement	530mm				
	Pit Depth	Apparatus Measurement	4500mm				
	Slab Open Size	Apparatus Measurement	1300mm X 3460mm				
	Existence of Leakage	Visual Investigation	not many				☐ Photo 1b
	Can Check Place of Leakage?	Visual Investigation	yes				☐ Photo 1b
	Is the Place of Leakage of Water Photoed?	Visual Investigation	yes				☐ Photo 1c
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	many				☐ Photo 1d
	Did Took the Photograph of the Severest situation?	Visual Investigation	Yes				☐ Photo 1d
	Are There Many Cracks?	Visual Investigation	medium				☐ Photo 1e
	Have taken the Photograph of the Largest Crack?	Visual Investigation	Yes				☐ Photo 1e
Valve Pit	Inside Diameter	Apparatus Measurement	1780mm X 2770mm				
	Outer Diameter	Apparatus Measurement	1670mm X 2570mm				
	Wall Thickness	Apparatus Measurement	390mm				
	Slab Thickness	Apparatus Measurement	180mm				
	Pit Depth	Apparatus Measurement	1500mm				
	Slab Open Size	Apparatus Measurement	1670mm X 2570mm				
	Existence of Leakage	Visual Investigation	not many				☐ Photo 2a
	Can Check the place of Leakage?	Visual Investigation	yes				☐ Photo 2a
	Is the Place of Leakage of Water Photoed?	Visual Investigation	no				☐
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	many				☐ Photo 2b
	Did Took the Photograph of the Severest situation?	Visual Investigation	yes				☐ Photo 2b
	Are There Many Cracks?	Visual Investigation	not many				☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no				☐
Inflow Pipe	Number	Visual Investigation	No. 1	No. 2	No. 3		☐ Photo 3a
	Diameter	Apparatus Measurement	370mm				
	Level	Apparatus Measurement	-1.44m				
	Material	Visual Investigation	Steel Pipe				
Outflow Pipe	Number	Visual Investigation	No. 1	No. 2			☐ Photo 4a
	Diameter	Apparatus Measurement	350mm				
	Level	Apparatus Measurement	0.26m				
	Material	Visual Investigation	Steel Pipe				
Manhole infront of one	Number	Visual Investigation	No. 1	No. 2	No. 3		☐ Photo 5a, 5b, 5c
	Diameter	Apparatus Measurement	1.07m	1.08m	1.05m		
	Level	Apparatus Measurement	0.97m	1.97m	-1.72m		
	Material	Visual Investigation	Concrete	Concrete	Concrete		
Pressure Pipe	Route	Data Collection and listening Investigation	Drawing				
	Diameter	Data Collection and listening Investigation	200mm				
	Material	Data Collection and listening Investigation	Steel Pipe				
Installation Year		Data Collection and listening Investigation	*****				
Repair Resume		Data Collection and listening Investigation	no				

Existing Item	Investigation Item	Work Form	Contents	Photo
Mechanical Facilities of Pump Station				
Pump	Is the Rust of a Pump Severe?	Visual Investigation	many / medium / not many	
	The Leakage of the Liquid from a Valve etc…	Visual Investigation		
		(The source Material which can check a position)		
	The allophone at the time of a drive.			
	Pumping Equipment…			
	Pump Specifications	Data Collection and listening Investigation	yes / no	
	Manufacturer	Data Collection and listening Investigation		
	Pump Type	Data Collection and listening Investigation		
	Pump Diameter	Data Collection and listening Investigation		
	Power	Data Collection and listening Investigation		
	Design Flow	Data Collection and listening Investigation		
	Head	Data Collection and listening Investigation		
	Charactersitic Curve of Pump	Data Collection and listening Investigation	yes / no	
	Pump Efficiency	Data Collection and listening Investigation	yes / no	
	Capacity of Pumping Facility	Data Collection and listening Investigation	yes / no	
	Installation Year	Data Collection and listening Investigation		
	Repair Resume	Data Collection and listening Investigation	yes / no	
	The Secured situation of replacement parts.	Data Collection and listening Investigation	yes / no	
Valve	Is the rust of a Valve Severe?	Visual Investigation	many / medium / not many	
	The leakage of the liquid from a valve etc…	(The source Material which can check a position)	many / medium / not many	
	Valve Type	Data Collection and listening Investigation		
	Valve Diameter	Data Collection and listening Investigation		
Electrical facilities of pump stations.				
Control Board	size	Apparatus Measurement		
	Base size	Apparatus Measurement		
	Is the rust of a pump severe?	Visual Investigation	many / medium / not many	
	Electrical facilities specifications	Data Collection and Listening Investigation		
	Installation Year	Data Collection and Listening Investigation	yes / no	
	Repair Resume	Data Collection and Listening Investigation	yes / no	

Davara Pump Stations Photographs

1.0 Pump Pit

1a. Place of facility

1b. Pump Pit Leakage Condition; Not many leakages

1c. Leakage at pipe 3

1d. Corrosion Check; All Steel Pipes badly corroded.

1e. Crack Condition; Cracks can be seen in the background left

2.0 Valve Pit

2a. Valve Pit Leakage Condition; not many leakages

2b. Corrosion condition; Steel Pipes severely corroded.

3.0 Inflow Pipe

3a. Inflow Pipe

4.0 Outflow Pipe

4a. Outflow Pipe

5.0 Manhole in front of one

5a. Manhole 1; Inflow Manhole

5b. Manhole 2; Inflow Manhole

5c. Manhole 3; Outflow Manhole

Pump Station Survey Report

Lawes Road Pump Station

Table of Contents

1.0 General

The Lawes Road Pump Station has been identified as another faulty pump Station. Due to its faulty pump, it was not operating effectively, resulting in blockage to almost the surface of the pump pit when visited for survey work. An alternate pump was used to pump the blockage to flow through before survey work commenced. The Information outlined below provides the results of the measurements made and conditions of the Pump Station according to the Checklist provided.

2.0 Pump Pit

2.1 Pump Pit Measurements:

a) Level of Pump Pit: -1.420m
b) Inside Diameter: 3830mm
c) Outside Diameter: 4230mm
d) Wall Thickness: 200mm
e) Slab Thickness: 570mm
f) Pit Depth: 3.25m
g) Slab Open Size: 1270mm X 3470mm

2.2 Pump Pit Leakage Condition

There were not many leakages along the 3 pressure pipes.

2.3 Pump Pit Corrosion condition

The Steel Pressure Pipes clearly shows corrosion or rust taking place.

2.4 Pump pit Crack condition

There are no cracks on the Pump Pit concrete walls.

3.0 Valve Pit

3.1 Valve Pit Measurements:

a) Inside Diameter: 1700mm X 2650mm
b) Outer Diameter: 2420mm X 3250mm
c) Wall Thickness: 220mm
d) Slab Thickness: 200mm
e) Pit Depth: 1460mm
f) Slab Open Size: 1700mm X 2650mm

3.2 Valve Pit Leakage Condition.

There are no leakages in the valve pit.

3.3 Valve Pit Corrosion condition

The Steel Pressure pipes are not severely corroded, however it is in its early stages.

3.4 Valve Pit crack condition

No cracks are visible in the valve pit.

4.0 Inflow Pipe

Pipe 1
Diameter: 375mm
Level: -1.39mm
Material: Steel Pipe

Pipe 2:
Diameter: 375mm
Level: -0.32m
Material: Steel Pipe

5.0 Outflow Pipe

Pipe 1
Diameter: 340mm
Level: 1.17m
Material: PVC Pipe

6.0 Manhole in front of one

Manhole 1, Inflow Manhole
Diameter: 680mm
Level: -0.31m
Material: Concrete

Manhole 2, Inflow Manhole
Diameter: 1.04mm
Level: -0.50m
Material: Concrete

7.0 Pressure Pipe

The route of flow is as shown in the Pit Section Diagram.
Diameter: 200mm
Material: Steel

8.0 Installation and Repair Resume

The Lawes Road Pump Station was installed in 1969.
There is no repair resumption yet on the pump station.

9.0 Conclusion

The Lawes Road Pump Station is not fully operational due to its faulty pump. However there is not much leakages, corrosion and cracks in its Pump pit and valve pit.

LAWES ROAD PUMP STATION *Surveyed: 07/04/11*

Existing Item	Investigation Item	Work Form	Contents/Results			Photo
Pump Yard	Place of Facilities	Sketch	Drawing			☐ Photo 1a
Pump Pit	Level of a Pump Pit	Apparatus Measurement	-1.420m			
	Inside Diameter	Apparatus Measurement	3830mm			
	Outer Diameter	Apparatus Measurement	4230mm			
	Wall Thickness	Apparatus Measurement	200mm			
	Slab Thickness	Apparatus Measurement	570mm			
	Pit Depth	Apparatus Measurement	3.25m			
	Slab Open Size	Apparatus Measurement	1270mm X 3470mm			
	Existence of Leakage	Visual Investigation	not many			☐ Photo 1b
	Can Check Place of Leakage?	Visual Investigation	Yes			☐ Photo 1b
	Is the Place of Leakage of Water Photoed?	Visual Investigation	no			☐
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	medium			☐
	Did Took the Photograph of the Severest situation?	Visual Investigation	no			☐ Photo 1c
	Are There Many Cracks?	Visual Investigation	not many			☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no			☐
Valve Pit	Inside Diameter	Apparatus Measurement	1700mm X 2650mm			
	Outer Diameter	Apparatus Measurement	2420mm X 3250mm			
	Wall Thickness	Apparatus Measurement	220mm			
	Slab Thickness	Apparatus Measurement	200mm			
	Pit Depth	Apparatus Measurement	1460mm			
	Slab Open Size	Apparatus Measurement	1700mm X 2650mm			
	Existence of Leakage	Visual Investigation	not many			☐ Photo 2a
	Can Check the place of Leakage?	Visual Investigation	yes			☐ Photo 2a
	Is the Place of Leakage of Water Photoed?	Visual Investigation	no			☐
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	not many			☐ Photo 2a
	Did Took the Photograph of the Severest situation?	Visual Investigation	no			☐ Photo 2b
	Are There Many Cracks?	Visual Investigation	not many			☐ Photo 2b
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no			☐
Inflow Pipe	Number	Visual Investigation	No. 1	No. 2	No. 3	☐ Photo 3a & 3b
	Diameter	Apparatus Measurement	375mm	375mm		
	Level	Apparatus Measurement	-0.34m	-0.32m		
	Material	Visual Investigation	Steel Pipe	Steel Pipe		
Outflow Pipe	Number	Visual Investigation	No. 1	No. 2		☐ Photo 4a
	Diameter	Apparatus Measurement	340mm			
	Level	Apparatus Measurement	1.17m			
	Material	Visual Investigation	PVC Pipe			
Manhole infront of one	Number	Visual Investigation	No. 1	No. 2	No. 3	☐Photo 5a, 5b
	Diameter	Apparatus Measurement	680mm	1.04m		
	Level	Apparatus Measurement	-0.31m	-0.50m		
	Material	Visual Investigation	Concrete	Concrete		
Pressure Pipe	Route	Data Collection and listening Investigation	Drawing			
	Diameter	Data Collection and listening Investigation	200mm			
	Material	Data Collection and listening Investigation	Steel Pipe			
Installation Year		Data Collection and listening Investigation	1969			
Repair Resume		Data Collection and listening Investigation	no			

Existing Item	Investigation Item	Work Form	Contents	Photo
Mechanical Facilities of Pump Station				
Pump	Is the Rust of a Pump Severe?	Visual Investigation	many / medium / not many	
	The Leakage of the Liquid from a Valve etc…	Visual Investigation		
		(The source Material which can check a position)		
	The allophone at the time of a drive.			
	Pumping Equipment…			
	Pump Specifications	Data Collection and listening Investigation	yes / no	
	Manufacturer	Data Collection and listening Investigation		
	Pump Type	Data Collection and listening Investigation		
	Pump Diameter	Data Collection and listening Investigation		
	Power	Data Collection and listening Investigation		
	Design Flow	Data Collection and listening Investigation		
	Head	Data Collection and listening Investigation		
	Charactersitic Curve of Pump	Data Collection and listening Investigation	yes / no	
	Pump Efficiency	Data Collection and listening Investigation	yes / no	
	Capacity of Pumping Facility	Data Collection and listening Investigation	yes / no	
	Installation Year	Data Collection and listening Investigation		
	Repair Resume	Data Collection and listening Investigation	yes / no	
	The Secured situation of replacement parts.	Data Collection and listening Investigation	yes / no	
Valve	Is the rust of a Valve Severe?	Visual Investigation	many / medium / not many	
	The leakage of the liquid from a valve etc…	(The source Material which can check a position)	many / medium / not many	
	Valve Type	Data Collection and listening Investigation		
	Valve Diameter	Data Collection and listening Investigation		
Electrical facilities of pump stations.				
Control Board	sizu	Apparatus Measurement		
	Base sizu	Apparatus Measurement		
	Is the rust of a pump severe?	Visual Investigation	many / medium / not many	
	Electrical facilities specifications	Data Collection and Listening Investigation		
	Installation Year	Data Collection and Listening Investigation	yes / no	
	Repair Resume	Data Collection and Listening Investigation	yes / no	

Lawes Road Pump Station Photographs

1.0 Pump Pit

1a. Place of Facility

1b. Leakage Condition; not many leakages along the pressure pipes

1c.Corrosion Condition; medium level of corrosion occurring on steel pipes

2.0 Valve Pit

2a. Leakage condition; No major leakage at all

2b. Corrosion Condition; not much corrosion, Crack condition; not much cracks

3.0 Inflow Pipe

3a. Inflow Pipe 1 is to the left and Outflow Pipe is at top right corner

3b. Inflow Pipe 2, (Inflow Pipe 1 is at the top right corner)

4.0 Outflow Pipe

4a. Outflow Pipe

5.0 Manhole in front of one

5a. Manhole 1, Inflow Manhole

5b. Manhole 2, Inflow Manhole

Pump Station Survey Report

Koki Pump Station

Table of Contents

1.0 General

The Koki Pump Station is also a blocked pump station due to its faulty pump; the pump pit is blocked to the top and the Valve Pit is totally covered with debris from leakage and rubbish. An alternate pump was used to pump the blockage to flow through before survey work commenced. The Information outlined below provides the results of the measurements made and conditions of the Pump Station according to the guidelines provided.

2.0 Pump Pit

2.1 Pump Pit Measurements:

a) Level of Pump Pit: -2.12m
b) Inside Diameter: 4000mm
c) Outside Diameter: 4300mm
d) Wall Thickness: 400mm
e) Slab Thickness: 450mm
f) Pit Depth: 3800mm
g) Slab Open Size: 2030mm X 3050mm

2.2 Pump Pit Leakage Condition

There are not many leakages along the 3 pressure pipes. *See Photo 1b.*

2.3 Pump Pit Corrosion condition

The Steel Pressure Pipes does not show any severe corrosion, however corrosion is in its early stages for the pressure pipes and other steel works.

2.4 Pump pit Crack condition

No cracks are visible on the Pump Pit concrete walls.

3.0 Valve Pit

3.1 Valve Pit Measurements:

a) Inside Diameter: 2100mm X 3200mm
b) Outer Diameter: 2350mm X 3450mm
c) Wall Thickness: 250mm
d) Slab Thickness: 120mm
e) Pit Depth: 1260mm
f) Slab Open Size: 2200mm X 3600mm

3.2 Valve Pit Leakage Condition.

No definite results due to the valve pit covered with debris. *(See Photo 2b)*

3.3 Valve Pit Corrosion condition

No definite results due to the valve pit covered with debris. *(See Photo 2b)*

3.4 Valve Pit crack condition

No definite results due to the valve pit covered with debris. *(See Photo 2b)*

4.0 Inflow Pipe

Pipe 1
Diameter: 350mm
Level: -0.98m
Material: Steel Pipe

Pipe 2
Diameter: 150mm
Level: -0.99m
Material: Steel Pipe

5.0 Outflow Pipe

Pipe 1
Diameter: 200mm
Level: 0.87m
Material: Steel Pipe

6.0 Manhole in front of one

Manhole 1, Inflow Manhole
Diameter: 1.06mm
Level: -0.91m *(Bottom of Manhole)*
Material: Concrete

Manhole 2, Inflow Manhole
Diameter: 1.08m
Level: -0.82m *(Bottom of Manhole)*
Material: Concrete

7.0 Pressure Pipe

The route of flow is as shown in the Pit Section Diagram.
Diameter: 200mm
Material: Steel

8.0 Installation and Repair Resume

Installation Year is not known however it is assumed to be in the early 70s and late 60s.
There is no repair resumption yet on the pump station.

9.0 Conclusion

To conclude, Koki Pump Station is another blocked pump station with the pump pit blocked due to its faulty pump; the Valve pit is also in a very bad condition with debris covering it.

KOKI PUMP STATION *Surveyed:23/03/2011*

Existing Item	Investigation Item	Work Form	Contents/Results			Photo
Pump Yard	Place of Facilities	Sketch	Drawing			☐ Photo 1a
Pump Pit	Level of a Pump Pit	Apparatus Measurement	-2.12m			
	Inside Diameter	Apparatus Measurement	4000mm			
	Outer Diameter	Apparatus Measurement	4300mm			
	Wall Thickness	Apparatus Measurement	400mm			
	Slab Thickness	Apparatus Measurement	450mm			
	Pit Depth	Apparatus Measurement	3800mm			
	Slab Open Size	Apparatus Measurement	2030mm X 3050mm			
	Existence of Leakage	Visual Investigation	not many			☐
	Can Check Place of Leakage?	Visual Investigation	No			☐
	Is the Place of Leakage of Water Photoed?	Visual Investigation	Yes			☐ Photo 1b
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	not many			☐ Photo 1c
	Did Took the Photograph of the Severest situation?	Visual Investigation	no			☐
	Are There Many Cracks?	Visual Investigation	not many			☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no			☐
Valve Pit	Inside Diameter	Apparatus Measurement	2100mm X 3200mm			
	Outer Diameter	Apparatus Measurement	2350mm X 3450mm			
	Wall Thickness	Apparatus Measurement	250mm			
	Slab Thickness	Apparatus Measurement	120mm			
	Pit Depth	Apparatus Measurement	1260mm			
	Slab Open Size	Apparatus Measurement	2200mm X 3600mm			
	Existence of Leakage	Visual Investigation	*Covered with Debris (See Photo)*			☐ Photo 2a & 2b
	Can Check the place of Leakage?	Visual Investigation	*Covered with Debris*			☐ Photo 2a & 2b
	Is the Place of Leakage of Water Photoed?	Visual Investigation	*Covered with Debris*			☐ Photo 2a & 2b
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	*Covered with Debris*			☐ Photo 2a & 2b
	Did Took the Photograph of the Severest situation?	Visual Investigation	*Covered with Debris*			☐ Photo 2a & 2b
	Are There Many Cracks?	Visual Investigation	*Covered with Debris*			☐ Photo 2a & 2b
	Have taken the Photograph of the Largest Crack?	Visual Investigation	*Covered with Debris*			☐ Photo 2a & 2b
						☐ Photo 2a & 2b
Inflow Pipe	Number	Visual Investigation	No. 1	No. 2	No. 3	☐ Photo 3a
	Diameter	Apparatus Measurement	350mm	150mm		
	Level	Apparatus Measurement	-0.98m	-0.99m		
	Material	Visual Investigation	Steel Pipe	Steel Pipe		
Outflow Pipe	Number	Visual Investigation	No. 1	No. 2		☐ Photo 4a
	Diameter	Apparatus Measurement	200mm			
	Level	Apparatus Measurement	0.87m			
	Material	Visual Investigation	Steel Pipe			
Manhole infront of one	Number	Visual Investigation	No. 1	No. 2	No. 3	☐ Photo 5a & 5b
	Diameter	Apparatus Measurement	1.06m	1.08m		
	Level	Apparatus Measurement	-0.91m	-0.82m		
	Material	Visual Investigation	Concrete	Concrete		
Pressure Pipe	Route	Data Collection and listening Investigation	Drawing			
	Diameter	Data Collection and listening Investigation	200mm			
	Material	Data Collection and listening Investigation	Steel Pipe			
Installation Year		Data Collection and listening Investigation	*****			
Repair Resume		Data Collection and listening Investigation	no			

Existing Item	Investigation Item	Work Form	Contents	Photo
Mechanical Facilities of Pump Station				
Pump	Is the Rust of a Pump Severe?	Visual Investigation	many / medium / not many	
	The Leakage of the Liquid from a Valve etc…	Visual Investigation		
		(The source Material which can check a position)		
	The allophone at the time of a drive.			
	Pumping Equipment…			
	Pump Specifications	Data Collection and listening Investigation	yes / no	
	Manufacturer	Data Collection and listening Investigation		
	Pump Type	Data Collection and listening Investigation		
	Pump Diameter	Data Collection and listening Investigation		
	Power	Data Collection and listening Investigation		
	Design Flow	Data Collection and listening Investigation		
	Head	Data Collection and listening Investigation		
	Charactersitic Curve of Pump	Data Collection and listening Investigation	yes / no	
	Pump Efficiency	Data Collection and listening Investigation	yes / no	
	Capacity of Pumping Facility	Data Collection and listening Investigation	yes / no	
	Installation Year	Data Collection and listening Investigation		
	Repair Resume	Data Collection and listening Investigation	yes / no	
	The Secured situation of replacement parts.	Data Collection and listening Investigation	yes / no	
Valve	Is the rust of a Valve Severe?	Visual Investigation	many / medium / not many	
	The leakage of the liquid from a valve etc…	(The source Material which can check a position)	many / medium / not many	
	Valve Type	Data Collection and listening Investigation		
	Valve Diameter	Data Collection and listening Investigation		
Electrical facilities of pump stations.				
Control Board	size	Apparatus Measurement		
	Base size	Apparatus Measurement		
	Is the rust of a pump severe?	Visual Investigation	many / medium / not many	
	Electrical facilities specifications	Data Collection and Listening Investigation		
	Installation Year	Data Collection and Listening Investigation	yes / no	
	Repair Resume	Data Collection and Listening Investigation	yes / no	

Koki Pump Station Photographs

1. **Pump Pit**

1a. Place of Facility

1b: Pump Pit Leakage Check; Not many leakages.

1c. Steel Rod Exposed; Corrosion not severe but starting

2. Valve Pit

2a. Valve Pit

2b. Valve Pit covered with debris and rubbish

3. Inflow Pipes

3a. Inflow Pipes

4. Outflow Pipe

4a. Outflow Pipe

5. Manhole In front of one

5a. Manhole 1, Inflow Manhole

5b. Manhole 2, Inflow Manhole

Pump Station Survey Report

Badili Pump Station

Table of Contents

1.0 General

The Badili pump station is another malfunctioning pump Station. It was not operating at all when survey work commenced on it. The Pump Pit was blocked to the surface when visited at that time due to faulty pump, thus an alternate pump was used to pump the blockage to flow through before survey work commenced on it. The Information outlined below provides the results of the measurements made and conditions of the Pump Station according to the Checklist provided.

2.0 Pump Pit

2.1 Pump Pit Measurements:

a) Level of Pump Pit: -3.10m
b) Inside Diameter: 3.73m
c) Outside Diameter: 4.13m
d) Wall Thickness: 200mm
e) Slab Thickness: 200mm
f) Pit Depth: 4250mm (Average)
g) Slab Open Size: 1340mm X 3334mm

2.2 Pump Pit Leakage Condition

There are not many leakages along the pressure pipes.

2.3 Pump Pit Corrosion condition

The Steel Pressure Pipes clearly shows corrosion or rust taking place.

2.4 Pump pit Crack condition

No cracks are visible on the Pump Pit concrete walls or steel rod exposed by cracks.

3.0 Valve Pit

3.1 Valve Pit Measurements:

a) Inside Diameter: 1560mm X 2330mm
b) Outer Diameter: 2660mm X 3440mm
c) Wall Thickness: 220mm
d) Slab Thickness: 180mm
e) Pit Depth: 1360mm
f) Slab Open Size: 1560mm X 2330mm

3.2 Valve Pit Leakage Condition.

There are not many leakages in the valve pit.

3.3 Valve Pit Corrosion condition

Pressure pipes in the valve pit are corroded. (Medium level of corrosion)

3.4 Valve Pit crack condition

No cracks are visible in the valve pit.

4.0 Inflow Pipe

Pipe 1
Diameter: 600mm
Level: -1.33m
Material: Steel Pipe

Pipe 2 (Blocked)
Diameter: 250mm
Level: -1.07m
Material: Steel Pipe

5.0 Outflow Pipe

Pipe 1
Diameter: 600mm
Level: -0.05m
Material: Steel Pipe

6.0 Manhole in front of one

Manhole 1
Diameter: 1.08m
Level: -1.01m
Material: Concrete

7.0 Pressure Pipe

The route of flow is as shown in the Pit Section Diagram.
Diameter: 150mm
Material: Steel

8.0 Installation and Repair Resume

Installation Year is not known however it is assumed to be in the early 70s and late 60s.
There is no repair resumption yet on the pump station.

9.0 Conclusion

The Badili Pump Station is faulty, malfunctioning and needs replacement.

BADILI PUMP STATION Surveyed: 05/04/2011

Existing Item	Investigation Item	Work Form	Contents/Results			Photo
Pump Yard	Place of Facilities	Sketch	Drawing			☐ Photo 1a
Pump Pit	Level of a Pump Pit	Apparatus Measurement	-3.10m			
	Inside Diameter	Apparatus Measurement	3730mm			
	Outer Diameter	Apparatus Measurement	4130mm			
	Wall Thickness	Apparatus Measurement	200mm			
	Slab Thickness	Apparatus Measurement	200mm			
	Pit Depth	Apparatus Measurement	4250mm (Average)			
	Slab Open Size	Apparatus Measurement	1340mm X 3334mm			
	Existence of Leakage	Visual Investigation	not many			☐ Photo 1b
	Can Check Place of Leakage?	Visual Investigation	Yes			☐ Photo 1b
	Is the Place of Leakage of Water Photoed?	Visual Investigation	no			☐ Photo 1b
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	medium			☐ Photo 1c
	Did Took the Photograph of the Severest situation?	Visual Investigation	Yes			☐ Photo 1c
	Are There Many Cracks?	Visual Investigation	not many			☐ Photo 1d
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no			☐ Photo 1d
Valve Pit	Inside Diameter	Apparatus Measurement	1560mm X 2330mm			
	Outer Diameter	Apparatus Measurement	2660mm X 3440mm			
	Wall Thickness	Apparatus Measurement	220mm			
	Slab Thickness	Apparatus Measurement	180mm			
	Pit Depth	Apparatus Measurement	1360mm			
	Slab Open Size	Apparatus Measurement	1560mm X 2330mm			
	Existence of Leakage	Visual Investigation	not many			☐ Photo 2a
	Can Check the place of Leakage?	Visual Investigation	yes			☐
	Is the Place of Leakage of Water Photoed?	Visual Investigation	no			☐ Photo 2a
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	medium			☐ Photo 2b
	Did Took the Photograph of the Severest situation?	Visual Investigation	yes			☐ Photo 2b
	Are There Many Cracks?	Visual Investigation	not many			☐ Photo 2c
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no			☐ Photo 2c
Inflow Pipe	Number	Visual Investigation	No. 1	No. 2	No. 3	☐ Photo 3a
	Diameter	Apparatus Measurement	600mm	250mm		
	Level	Apparatus Measurement	-1.33m	-1.07m		
	Material	Visual Investigation	Steel Pipe	*Steel (Blocked/Closed)*		
Outflow Pipe	Number	Visual Investigation	No. 1	No. 2		☐ Photo 4a
	Diameter	Apparatus Measurement	600mm			
	Level	Apparatus Measurement	-0.05m			
	Material	Visual Investigation	Steel Pipe			
Manhole infront of one	Number	Visual Investigation	No. 1	No. 2	No. 3	☐ Photo 5a, 5b
	Diameter	Apparatus Measurement	1.08m			
	Level	Apparatus Measurement	-1.01m			
	Material	Visual Investigation	Concrete			
Pressure Pipe	Route	Data Collection and listening Investigation	Drawing			
	Diameter	Data Collection and listening Investigation	150mm			
	Material	Data Collection and listening Investigation	Steel			
Installation Year		Data Collection and listening Investigation	*****			
Repair Resume		Data Collection and listening Investigation	no			

Existing Item	Investigation Item	Work Form	Contents	Photo
Mechanical Facilities of Pump Station				
Pump	Is the Rust of a Pump Severe?	Visual Investigation	many / medium / not many	
	The Leakage of the Liquid from a Valve etc…	Visual Investigation		
		(The source Material which can check a position)		
	The allophone at the time of a drive.			
	Pumping Equipment…			
	Pump Specifications	Data Collection and listening Investigation	yes / no	
	Manufacturer	Data Collection and listening Investigation		
	Pump Type	Data Collection and listening Investigation		
	Pump Diameter	Data Collection and listening Investigation		
	Power	Data Collection and listening Investigation		
	Design Flow	Data Collection and listening Investigation		
	Head	Data Collection and listening Investigation		
	Charactersitic Curve of Pump	Data Collection and listening Investigation	yes / no	
	Pump Efficiency	Data Collection and listening Investigation	yes / no	
	Capacity of Pumping Facility	Data Collection and listening Investigation	yes / no	
	Installation Year	Data Collection and listening Investigation		
	Repair Resume	Data Collection and listening Investigation	yes / no	
	The Secured situation of replacement parts.	Data Collection and listening Investigation	yes / no	
Valve	Is the rust of a Valve Severe?	Visual Investigation	many / medium / not many	
	The leakage of the liquid from a valve etc…	(The source Material which can check a position)	many / medium / not many	
	Valve Type	Data Collection and listening Investigation		
	Valve Diameter	Data Collection and listening Investigation		
Electrical facilities of pump stations.				
Control Board	size	Apparatus Measurement		
	Base size	Apparatus Measurement		
	Is the rust of a pump severe?	Visual Investigation	many / medium / not many	
	Electrical facilities specifications	Data Collection and Listening Investigation		
	Installation Year	Data Collection and Listening Investigation	yes / no	
	Repair Resume	Data Collection and Listening Investigation	yes / no	

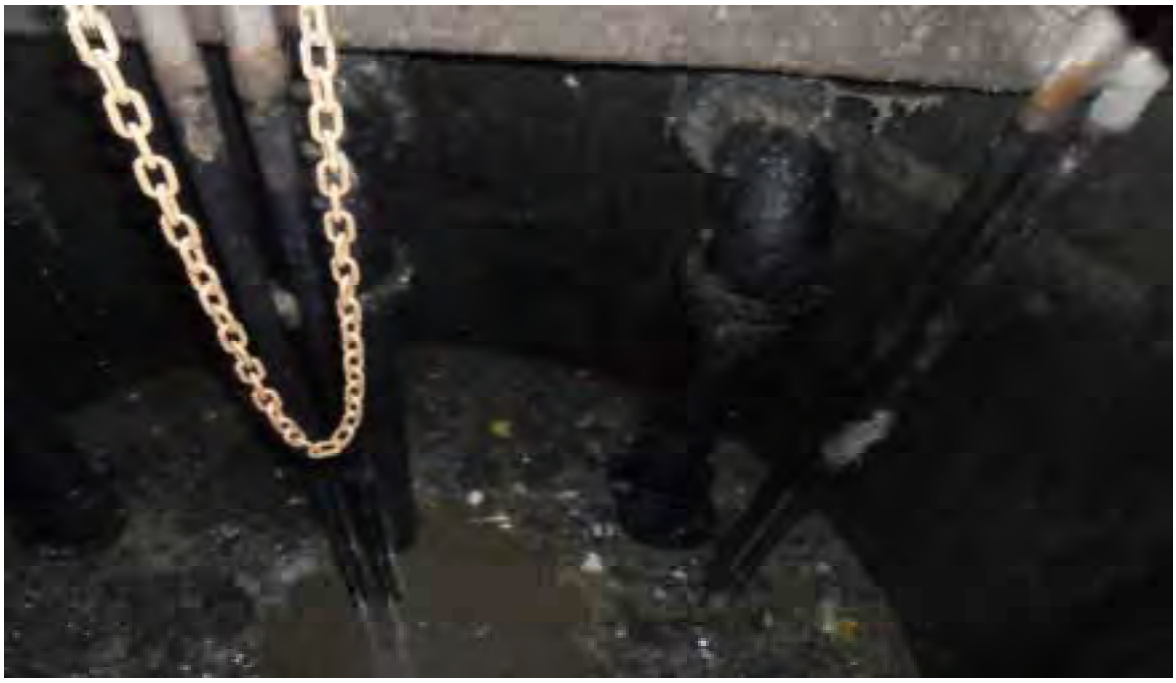
Badili Pump Station Photographs

1.0 Pump Pit

1a. Place of Facility

1b. Leakage Condition: there are no leakages

1c. Corrosion condition; medium level of corrosion



1d Crack condition, no cracks

2.0 Valve Pit

2a. Leakage Condition; no leakages

2b. Corrosion condition; medium level of corrosion occurring on steel

2c. Crack Condition; not many cracks.

3.0 Inflow Pipe

3a. Inflow Pipe; 600mm diameter

3b. Inflow Pipe 2; blocked Pipe. Diameter is 250mm.

4.0 Outflow Pipe

4a. Outflow Pipe

5.0 Manhole in front of one

5a. Inflow Manhole

5b. Inflow Manhole

Pump Station Survey Report

Kaugere Pump Station

Table of Contents

1.0 General

The Kaugere Pump Station is a faulty pump Station. It was not operating at all when survey work commenced on it. The Pump Pit was blocked to the surface when visited at that time, thus an alternate pump was used to pump the blockage to flow through before survey work commenced on it, however when pumped water level couldn't drop to the floor of the pump pit, thus making it impossible to measure one of the inflow pipe. The valve pit was also overflowed until drained. The Information outlined below provides the results of the measurements made and conditions of the Pump Station according to the Checklist provided.

2.0 Pump Pit

2.1 Pump Pit Measurements:

a) Level of Pump Pit: 12.29m
b) Inside Diameter: 1600mm
c) Outside Diameter: 2000mm X 2000mm
d) Wall Thickness: 200mm
e) Slab Thickness: 200mm
f) Pit Depth: 3600m
g) Slab Open Size: 700mm X 1560mm

2.2 Pump Pit Leakage Condition

There could be leakages along the pressure pipes. However as the pit is block it is not possible to comment on the area below the blockage as it is not visible.

2.3 Pump Pit Corrosion condition

The Steel Pressure Pipes clearly shows corrosion or rust taking place.

2.4 Pump pit Crack condition

No cracks are visible on the Pump Pit concrete walls.

3.0 Valve Pit

3.1 Valve Pit Measurements:

a) Inside Diameter: 700mm X 1600mm
b) Outer Diameter: 2000mm X 2000mm
c) Wall Thickness: 200mm
d) Slab Thickness: 140mm
e) Pit Depth: 2300mm
f) Slab Open Size: 700mm X 1600mm

3.2 Valve Pit Leakage Condition.

The valve pit does not have leakages.

3.3 Valve Pit Corrosion condition

The pressure pipes in the Valve pit are severely corroded.

3.4 Valve Pit crack condition

No cracks are visible in the valve pit.

4.0 Inflow Pipe

Pipe 1
Diameter: 150mm
Level: 13.04m
Material: Steel Pipe

Inflow pipe 2 is not measured due to pump pit blockage; however only the inflow manhole is shown on the plan.

5.0 Outflow Pipe

Pipe 1
Diameter: 200mm
Level: 13.99m
Material: Steel Pipe

6.0 Manhole in front of one

Manhole 1
Diameter: 1.08mm
Level: 13.74m
Material: Concrete

Manhole 2
Diameter: 1.08m
Level: 13.25m

7.0 Pressure Pipe

The route of flow is as shown in the Pit Section Diagram.
Diameter: 200mm
Material: Steel

8.0 Installation and Repair Resume

Installation Year is not known however it is assumed to be in the early 70s and late 60s.
There is no repair resumption yet on the pump station.

9.0 Conclusion

The Kaugere pump station is another faulty pump station and is not operational. The pump pit was blocked when survey work commenced. Most of the steel are severely corroded as it was installed in the 60's and 70's.

KAUGERE PUMP STATION *Surveyed: 06/04/2011*

Existing Item	Investigation Item	Work Form	Contents/Results			Photo
Pump Yard	Place of Facilities	Sketch	Drawing			☐
Pump Pit	Level of a Pump Pit	Apparatus Measurement	12.29m			
	Inside Diameter	Apparatus Measurement	1600mm			
	Outer Diameter	Apparatus Measurement	2000mm X 2000mm			
	Wall Thickness	Apparatus Measurement	200mm			
	Slab Thickness	Apparatus Measurement	200mm			
	Pit Depth	Apparatus Measurement	3600m			
	Slab Open Size	Apparatus Measurement	700mm X 1560mm			
	Existence of Leakage	Visual Investigation	not many			☐ Photo 1a
	Can Check Place of Leakage?	Visual Investigation	no			☐
	Is the Place of Leakage of Water Photoed?	Visual Investigation	no			☐
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	many			☐
	Did Took the Photograph of the Severest situation?	Visual Investigation	Yes			☐ Photo 1a
	Are There Many Cracks?	Visual Investigation	not many			☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no			☐
Valve Pit	Inside Diameter	Apparatus Measurement	700mm X 1600mm			
	Outer Diameter	Apparatus Measurement	2000mm X 2000mm			
	Wall Thickness	Apparatus Measurement	200mm			
	Slab Thickness	Apparatus Measurement	140mm			
	Pit Depth	Apparatus Measurement	2300mm			
	Slab Open Size	Apparatus Measurement	700mm X 1600mm			
	Existence of Leakage	Visual Investigation	not many			☐ Photo 2a
	Can Check the place of Leakage?	Visual Investigation	no			☐ Photo 2a
	Is the Place of Leakage of Water Photoed?	Visual Investigation	no			☐
	Are There many Parts which the Steel Rod has Exposed?	Visual Investigation	many			☐ Photo 2b
	Did Took the Photograph of the Severest situation?	Visual Investigation	yes			☐ Photo 2b
	Are There Many Cracks?	Visual Investigation	not many			☐
	Have taken the Photograph of the Largest Crack?	Visual Investigation	no			☐
Inflow Pipe	Number	Visual Investigation	No. 1	No. 2	No. 3	☐
	Diameter	Apparatus Measurement	150mm			
	Level	Apparatus Measurement	13.04m			
	Material	Visual Investigation	Steel Pipe			
Outflow Pipe	Number	Visual Investigation	No. 1	No. 2		☐
	Diameter	Apparatus Measurement	200mm			
	Level	Apparatus Measurement	13.99m			
	Material	Visual Investigation	Steel Pipe			
Manhole infront of one	Number	Visual Investigation	No. 1	No. 2	No. 3	☐ Photo 3a & 3b
	Diameter	Apparatus Measurement	1.08m	1.08m		
	Level	Apparatus Measurement	13.74m	13.25m		
	Material	Visual Investigation	Concrete	Concrete		
Pressure Pipe	Route	Data Collection and listening Investigation	Drawing			
	Diameter	Data Collection and listening Investigation	200mm			
	Material	Data Collection and listening Investigation	Steel			
Installation Year		Data Collection and listening Investigation	*****			
Repair Resume		Data Collection and listening Investigation	no			

Existing Item	Investigation Item	Work Form	Contents	Photo
Mechanical Facilities of Pump Station				
Pump	Is the Rust of a Pump Severe?	Visual Investigation	many / medium / not many	
	The Leakage of the Liquid from a Valve etc…	Visual Investigation		
		(The source Material which can check a position)		
	The allophone at the time of a drive.			
	Pumping Equipment…			
	Pump Specifications	Data Collection and listening Investigation	yes / no	
	Manufacturer	Data Collection and listening Investigation		
	Pump Type	Data Collection and listening Investigation		
	Pump Diameter	Data Collection and listening Investigation		
	Power	Data Collection and listening Investigation		
	Design Flow	Data Collection and listening Investigation		
	Head	Data Collection and listening Investigation		
	Charactersitic Curve of Pump	Data Collection and listening Investigation	yes / no	
	Pump Efficiency	Data Collection and listening Investigation	yes / no	
	Capacity of Pumping Facility	Data Collection and listening Investigation	yes / no	
	Installation Year	Data Collection and listening Investigation		
	Repair Resume	Data Collection and listening Investigation	yes / no	
	The Secured situation of replacement parts.	Data Collection and listening Investigation	yes / no	
Valve	Is the rust of a Valve Severe?	Visual Investigation	many / medium / not many	
	The leakage of the liquid from a valve etc…	(The source Material which can check a position)	many / medium / not many	
	Valve Type	Data Collection and listening Investigation		
	Valve Diameter	Data Collection and listening Investigation		
Electrical facilities of pump stations.				
Control Board	size	Apparatus Measurement		
	Base size	Apparatus Measurement		
	Is the rust of a pump severe?	Visual Investigation	many / medium / not many	
	Electrical facilities specifications	Data Collection and Listening Investigation		
	Installation Year	Data Collection and Listening Investigation	yes / no	
	Repair Resume	Data Collection and Listening Investigation	yes / no	

Kaugere Pump Station Photographs

1.0 Pump Pit

1a. Pump pit leakage Condition; there could be leakages below, middle pipe is spare pipe. Corrosion condition; Corrosion is occurring on steel pipes.

2.0 Valve Pit

2a. Leakage condition; there is leakage in the valve pit

2b. Corrosion condition; there is corrosion in the valve pit steel pressure pipes

3.0 Manhole in front of one

3a. Inflow Manhole 1

3b. Inflow Manhole 2