

**Appendix 7.4 Detailed estimation of sewage flow generated from project**  
**Sewage Discharge Estimation**

Rev.: 0  
 Date : 22-Apr-14

Based on the architectural layout plan received from Aedas on 3 April 2014.

**1. Sewage Discharge Estimation for Waterpark & Existing Ocean Park Facilities**

Discharge From Population				
Building / Activity Area	Source	Population (person)	Daily Water Discharge Rate (l/person/day)	Daily Water Discharge (m <sup>3</sup> /day)
Waterpark	Guest	*Note 10 10500	*Note 1 20	210.00
	Staff	*Note 8 500	*Note 2 80	40.00
Sub-total				250.00 (a)

Opening Hours	No. of Opening Hour (Hours)
14	9am - 11pm
14	9am - 11pm

Discharge From F&B						
Source	GFA (m <sup>2</sup> ) *Note 9	UFA (m <sup>2</sup> ) *Note 4	No. of Guest *Note 12	No. of Employee *Note 13	Daily Water Discharge Rate (l/person/day) *Note 5	Daily Water Discharge (m <sup>3</sup> /day)
L1 - F&B	625	500	333	67	1580	105.33
L1 - Canteen	270	216	144	29	1580	45.50
L1 - F&B	1255	1004	669	134	1580	211.51
L2- F&B	460	368	245	49	1580	77.53
L2- F&B	93	74	50	10	1580	15.67
Sub-total						455.55 (b)

Opening Hours	No. of Opening Hour (Hours)
14	9am - 11pm
14	9am - 11pm
14	9am - 11pm
14	9am - 11pm
14	9am - 11pm

Demand From Cleansing Water				
Source	No. of Cleansing Point *Note 8	Water Consumption of Each Point (L/ Point)	Daily Water Discharge (m <sup>3</sup> /day)	
Cleansing Water	100	45	4.5	
Sub-total			4.50 (c)	

Opening Hours	No. of Opening Hour (Hours)
14	9am - 11pm

Discharge From Existing TSW Facilities			
Source	Meter No.	Existing Meter Reading (m <sup>3</sup> /day)	Estimated Daily Water Discharge due to extended operating hours (m <sup>3</sup> /day)
Development Headland & Inter-Mediate Rides	M10-600668	*Note 6 0.40	0.47
Headland and Intermediate Rides Flume Ride	M11-480038	*Note 7 60.00	70.00
Sub-total			70.47 (d)

Opening Hours	No. of Opening Hour (Hours)
14	9am - 11pm
14	9am - 11pm

**2. Sewage Discharge Estimation for Fisherman's Wharf Hotel**

Discharge From Future Hotel - Fisherman's Wharf Hotel					
Source	No. of Guestroom	Population Density (No. of Employee/ room)	No. of Employee	Daily Discharge Rate (l/person/day) *Note 5	Daily Water Discharge (m3/day)
Fisherman's Wharf Hotel	460	*Note 8	0.5	230	1580
					363.40
				Sub-total	363.40

Opening Hours	
24 hours a day	*Note 8

**3. Sewage Discharge Estimation for Spa Hotel**

Discharge From Future Hotel - Spa Hotel					
Source	No. of Guestroom	Population Density (No. of Employee/ room)	No. of Employee	Daily Discharge Rate (l/person/day) *Note 5	Daily Water Discharge (m3/day)
Spa Hotel	180	*Note 8	0.5	90	1580
					142.20
				Sub-total	142.20

Opening Hours	
24 hours a day	*Note 8

**4. Total Discharge from Ocean Park to 450mm diameter Sewer**

Source	Total Flow
Water Park (a) + (b) + (c)	710.05
Discharge From Existing TSW Facilities (d)	70.47
Fisherman's Wharf Hotel (e)	363.40
Spa Hotel (f)	142.20
<b>Total Average Daily Flow (m<sup>3</sup>/day)</b>	<b>1286.11</b>
Contributing Population	<b>4763.38</b>
Peaking Factor	<b>6.00</b>
<b>Total Peak Flow (L/s)</b>	<b>153.11</b>

- \*Note 1: Data taken from "Plumbing Engineering Services Design Guide - Hot and cold water supplies", Table 2: Daily Water Demand - Sports Changing - Swimming Pool: 20L/ person.
- \*Note 2: Data taken from "EPD/TP 1/05 Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning", Table T-2 - Commercial Employee: 80 L/day.
- \*Note 3: Data taken from "EPD/TP 1/05 Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning", Table T-5 - Peaking Factors.
- \*Note 4: Assume 80% of the GFA is UFA.
- \*Note 5: Data taken from "EPD/TP 1/05 Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning", Table T-2: J10 - Restaurants & Hotels 1.500 m3/day and Commercial Employee 0.080 m3/day.
- \*Note 6: By referring to the Meter Reading in April of "Average Daily Consumption" table of the bill (Charge No.: 90930800009) for "Development Headland & Inter-Mediate Rides" and taking the peak value in the entire year.
- \*Note 7: By referring to the Meter Reading in January of "Average Daily Consumption" table of the bill (Charge No.: 74650000008) for "Headland and Intermediate Rides Flume Ride" and taking the peak value in the entire year.
- \*Note 8: Figures estimated by Meinhardt.
- \*Note 9: Data taken from the architectural layout plan received from Aedas on 3 April 2014'
- \*Note 10: Figures taken from "100% Schematic Design Report" received on 7 Feb 2014 From Aedas.
- \*Note 11: Peak Flow is calculated according to the 14 working hours per day.
- \*Note 12: Assume 1 guest occupies 1 .5m<sup>2</sup> of the seating area.
- \*Note 13: Assume 1 employee serves 5 guests.
- \*Note 14: According to Clause 12.1 of "EPD/TP 1/05 Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning",