

## ***Appendix 5***

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### **Water Demand Assessment**

**CM010 - The Pulse Repulse Bay  
Water Demands**

Refer:

1. Approved GBP for Existing Building
2. Proposed Layouts for Future Redevelopment
3. PlanD "Commercial and Industrial Floorspace Utilization Survey" (CIFSUS) Report, Figure 9: Worker Density by Industry Group
4. EPD "Guidelines for the Estimation of Sewage Flow for Sewage Infrastructure Planning" (GESF), Table T-2: Unit Flow Factors for Commercial Flows and Student Flows
5. Building (Standards of Sanitary Fitments, Plumbing Drainage Works and Latrines) Regulations (Cap. 123I, Section 7A):

**Note: The areas and populations in this assessment relate to the sections of the building affected by the proposed hotel redevelopment only.**

**Existing**

Floor	Utilization	GFA (m <sup>2</sup> )	Worker Density (No./100m <sup>2</sup> )	No. of Workers/ Vistors		Commercial Activity	Unit Flow Factor (Sewage) (m <sup>3</sup> /h/d)	Daily Sewage Flow (m <sup>3</sup> /d)	Sewage Flow Ratio to Water Demand	Total Water Demand (m <sup>3</sup> /d)	Freshwater Demand @77% <sup>3</sup> (m <sup>3</sup> /d)	Saltwater Demand @23% <sup>3</sup> (m <sup>3</sup> /d)
				(Calc)	(Say)							
Upper Ground Floor	Retail	3,697.255	3.5	129.40	130	J4	0.280	36.4	100%	36.4	28.0	8.4
First Floor	Restaurant <sup>1</sup>	3,603.360	5.1	183.77	184					149.2	109.7	39.5
B1 Toilets - Male	Shopping <sup>2</sup>			500	500	Person*	0.040	20.0	100%	20.0	15.4	4.6
B1 Toilets - Female	Shopping <sup>2</sup>			160	160	Person*	0.040	6.4	100%	6.4	4.9	1.5
<b>Existing Total Daily Demands from B1/F (Part), UGF &amp; 1F</b>										<b>212.0</b>	<b>158.1</b>	<b>53.9</b>

**Note:**

- 1 - Flow per restaurant employee assumed to be the same as for hotel employees (same category in GESF). Flows calculated on a pro rata basis using employee numbers and future hotel water demand.
- 2 - Unit users of Shopping Arcade assumed as School Students from Table T-2 of GESF
- 3 - Please refer to the following page for details

**Future**

Floor	Utilization	No. of Rooms	Remarks	Unit Flow Factor Freshwater (m <sup>3</sup> /Room/d)	Unit Flow Factor Saltwater (m <sup>3</sup> /Room/d)	Freshwater Demand (m <sup>3</sup> /d)	Saltwater Demand (m <sup>3</sup> /d)
B1 (Part), UGF & 1F	Hotel	96	Hotel to have 161 Employees	1.00	0.36	96.0	34.6
<b>Future Total Daily Demands from B1/F (Part), UGF &amp; 1F</b>						<b>96.0</b>	<b>34.6</b>
<b>Differences</b>						<b>-62.1</b>	<b>-19.4</b>

**Water Demand Parameters from WSD DI 1309 compared to Sewage Flows from EPD GESF**

Data from:

1. WSD DI 1309 - Design Criteria
2. EPD/TP 1/05 - Guidelines for Estimating Sewage Flows for Sewage Infrastructure Planning

Housing Type	Unit	Freshwater Unit Demand	Saltwater Unit Demand	Total Water Demand	Freshwater %age	Saltwater %age
Private Development - R1	m <sup>3</sup> /h/d	0.230	0.070	0.300	77%	23%
Private Development - R2	m <sup>3</sup> /h/d	0.300	0.070	0.370	81%	19%
Private Development - R3	m <sup>3</sup> /h/d	0.390	0.070	0.460	85%	15%
Private Development - R4	m <sup>3</sup> /h/d	0.390	0.070	0.460	85%	15%
Government Housing Estates (Public Rental)	m <sup>3</sup> /h/d	0.190	0.070	0.260	73%	27%
Tradition Village	m <sup>3</sup> /h/d	0.115	0.070	0.185	62%	38%
Modern Village	m <sup>3</sup> /h/d	0.230	0.070	0.300	77%	23%
				<b>Averages</b>	<b>77%</b>	<b>23%</b>