



# Is Inexpensive to Recycle Waste Water

Sr Andrew Ng Shou Guan  
ELP Quantity Surveyors Sdn Bhd

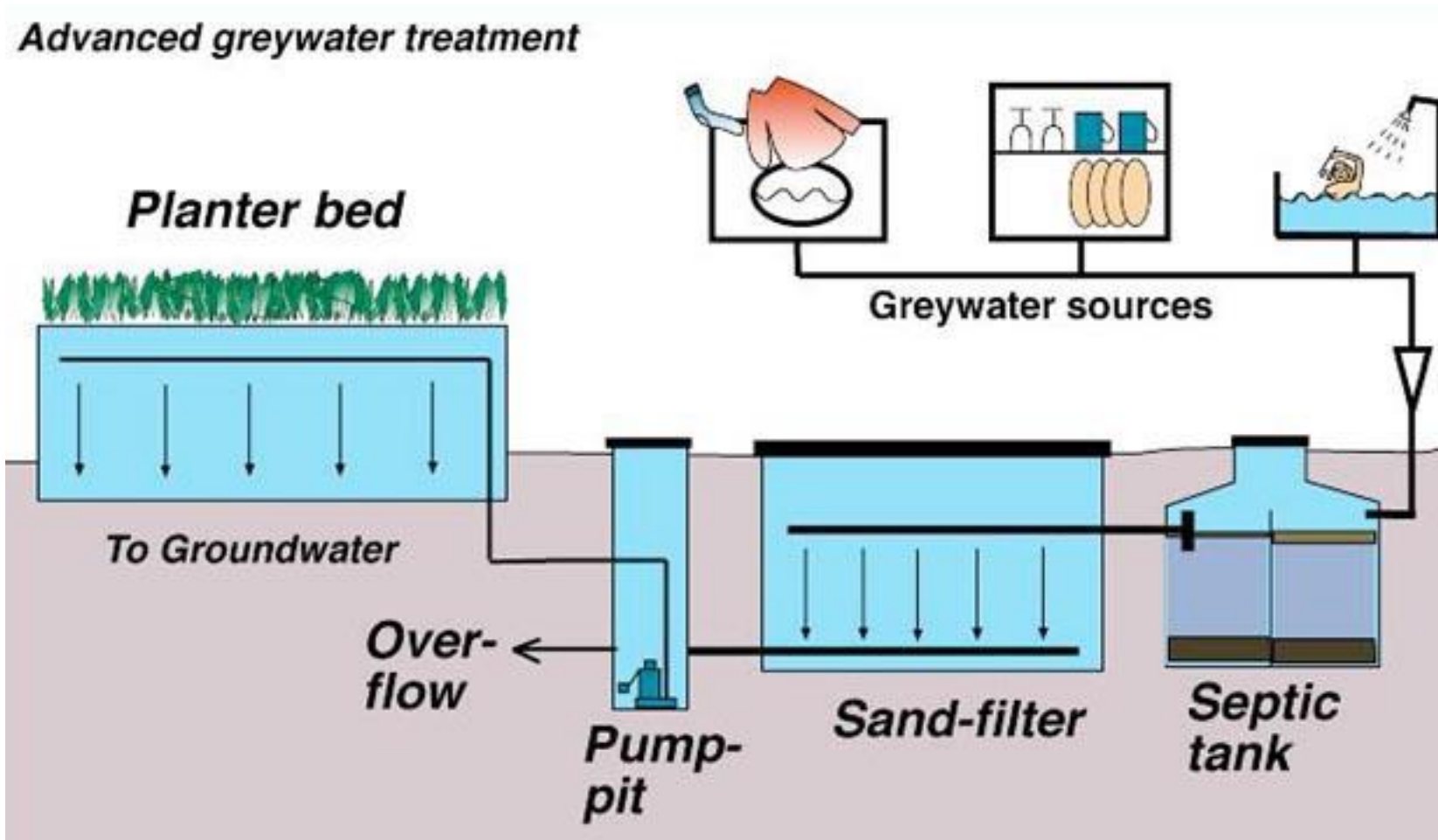
# Misconception

- ▶ Treating grey water is a complex process
- ▶ Therefore it is a costly to invest in grey water treatment

## GBI certified project that scored in Water Recycling

- ▶ Completion & Verification Assessment (CVA) : 6
- ▶ Design Assessment (DA) : 19
- ▶ Total CVA + DA = 25
- ▶ Total GBI certified project to-date = 407
- ▶ 6% of projects scored in WE2 only

# Simple Process





# Component

- ▶ Pipe works
- ▶ Septic tank
- ▶ Sand bed filter
- ▶ pump

# Case Study No 1

- ▶ Construction type : Non-residential New Construction
- ▶ Function : Office
- ▶ GBI Rating : Platinum
- ▶ Qualifying Expenditure for waste water recycling : RM19,769.00
- ▶ Total Qualifying Expenditure : RM4,532,524.40
- ▶ % age of QE for WE2 / Total QE = 0.4%
- ▶ Points scored for WE 2 = 2 points
- ▶ Total Points with QE = 42 points
- ▶ %age of WE2 Points/Total Points = 5%
- ▶ 0.4% of expenditure scored 5% of points

# Case Study No 1

Net Saleable Area : 14766m<sup>2</sup>

- ▶ Overall QE / NSA = RM 438.15/m<sup>2</sup> or RM40.70 psf
- ▶ QE for WE2 / NSA = RM 1.34 /m<sup>2</sup> or RM 0.12 psf
  
- ▶ Overall QE / Point = RM 108,000 / point
- ▶ QE for WE2 / Point = RM 9,900 / point
- ▶ The cost per point for WE2 is about 10 times lower than the average
- ▶ It is also significantly lower than most of the items

# Case Study No. 1 - Cost Per Point

Criteria	Item	Amount	GBI CVA	RM/Point
EE1	Minimum EE Performance	555,602.10	1	555,602.10
EE2	Lighting Zones	8,400.00	2	4,200.00
EE4	Renewable Energy	1,642,040.00	5	328,408.00
EE5	Advance EE Performance	377,355.00	15	25,157.00
EQ3	Carbon Monoxide Monitoring & Control	10,800.00	1	10,800.00
EQ4	Indoor Air Pollutants	516,363.20	2	258,181.60
EQ8	Daylighting	641,767.30	2	320,883.65
EQ9	Daylight Glare Control	362,463.00	1	362,463.00
SM12	Greenery & roof	9,800.00	2	4,900.00

# Case Study No. 1 - Cost Per Point

MR2	Recycled Content Materials	156,898.70	1	156,898.70
MR5	Storage & Collection of Recycleable	6,000.00	1	6,000.00
WE1	Rainwater Harvesting	31,210.10	2	15,605.05
WE2	Water Recycling	19,769.00	2	9,884.50
WE4	Water Efficient Fittings	31,479.00	2	15,739.50
IN1	Heat Pipe Technology	10,200.00	1	10,200.00
IN1	Advance Air Filtration	52,377.00	1	52,377.00
IN2	GBI Facilitator	100,000.00	1	100,000.00
	Total	4,532,524.40	42	107,917.25



## Case Study No 2

- ▶ Construction type : Industrial Existing Building
- ▶ Function : Industrial
- ▶ GBI Rating : Certified
- ▶ Qualifying Expenditure for waste water recycling : RM2,900.00
- ▶ Qualifying Expenditure : RM276,650.10
- ▶ %age of QE for WE2 / QE : 1%
- ▶ Point scored for WE2 : 3 points (maximum)
- ▶ Total points scored with QE : 30 points
- ▶ WE2 points / Total points points =  $3 / 30 = 10\%$
- ▶ 1% of cost scored 10% of the total points



## Case Study No. 2

- ▶ Overall QE / Point = RM 4940 / point
- ▶ QE for WE2 / Point = RM 967 / point
  
- ▶ The cost per point is 1/5 of the average

# Case Study No.2 - Cost Per Point

Criteria		Amount	GBI CVA score	RM/Point
EE3	Electrical Sub-Metering	8,712.50	2	4,356.25
EE5	Advanced or Improved EE Performance - BEI and /or EUI	11,500.00	3	3,833.33
EQ4	Indoor Air Pollutants & Industrial Chemical Exposure	14,324.00	2	7,162.00
EQ6	Thermal Comfort: Controllability of Systems	88,019.40	2	44,009.70
EQ9	Daylighting	52,820.00	4	13,205.00
EQ12	High Frequency Ballasts	3,577.50	1	3,577.50
MR5	Storage, Collection & Disposals of Recyclables	2,916.00	3	972.00

# Case Study No 2 - Cost Per Point

WE1	Rainwater Harvesting	31,930.00	1	31,930.00
WE2	Water Recycling	2,900.00	3	966.67
WE3	Water Efficient - Irrigation/Landscaping	1,600.00	2	800.00
WE5	Metering & Leak Detection System	720.00	2	360.00
IN1	Eco-refrigerant: COLD 22	8,630.70	1	8,630.70
	Condensate Water Harvesting	800.00	1	800.00
	Water Pump for condensate Water	900.00	1	900.00
	Recycled Fire System Water Piping	2,800.00	1	2,800.00
	Gas Meter	40,500.00	1	40,500.00
	Total	272,650.10	30	9,088.34

# Case Study No 2

- ▶ Water pipes that distribute recycled water for irrigation
- ▶ Not claimed under WE2 but under WE3 Water efficient - irrigation/landscaping
- ▶ Total cost RM1,600
- ▶ Points scored 2
- ▶ Distribution pipework for waste water recycling could be used to score 2 additional points

# Conclusion

- ▶ From the two case studies:
  - ▶ A. the absolute cost for waste water treatment is low
  - ▶ B. the cost / NFA for waste water treatment is low
  - ▶ C. the cost per point scored is low compared to the average, ranging from 5 to 10 times lower than the average
  
- ▶ Therefore, WE2 is a good option to consider when additional points are required to achieve the desired level of certification



# Question & Answer