Q. Wastewater flow fluctuation measured for every 2 hrs. Calculate equalization tank volume.

Ref: Example 5.3, Page 98, Wastewater Treatment: concepts and design apprach/GL Karia & RA Christian

Time, h	Time period	Actual Δq	Actual Cumulative flow, m^3	Planned Δq	Planned Cumulative flow	Differece Δq	Cumulative difference
0			0		0.00		0.00
2	0 - 2	25	25	18.75	18.75	6.25	6.25
4	2 - 4	25	50	18.75	37.50	6.25	12.50
6	4 - 6	25	75	18.75	56.25	6.25	18.75
8	6 - 8	25	100	18.75	75.00	6.25	25.00
10	8 - 10	20	120	18.75	93.75	1.25	26.25
12	10 - 12	10	130	18.75	112.50	-8.75	17.50
14	12 - 14	10	140	18.75	131.25	-8.75	8.75
16	14 - 16	10	150	18.75	150.00	-8.75	0.00
18	16 - 18	10	160	18.75	168.75	-8.75	-8.75
20	18 - 20	10	170	18.75	187.50	-8.75	-17.50
22	20 - 22	28	198	18.75	206.25	9.25	-8.25
24	22 - 24	27	225	18.75	225.00	8.25	0.00

Q_{avg} = 9.38

Volume = 26.25 + 17.5 = 43.75

Q. Hourly wastewater flow fluctuation measured. Calculate equalization tank volume.

Ref: Example 5.4, Page 99, Wastewater Treatment: concepts and design approach/GL Karia & RA Christian

Time, *h*	Time period	Flow m^3/min	Flow m^3/hr	Cumulative Flow, m^3	Planned flow Δq	Planned Cum.	Difference
1	0 - 1	2.0	120	120	745.25	745.25	-625.25
2	1 - 2	7.2	432	552	745.25	1490.50	-938.50
3	2 - 3	7.5	450	1002	745.25	2235.75	-1233.75
4	3 - 4	6.7	402	1404	745.25	2981.00	-1577.00
5	4 - 5	8.3	498	1902	745.25	3726.25	-1824.25
6	5 - 6	9.3	558	2460	745.25	4471.50	-2011.50
7	6 - 7	20.0	1200	3660	745.25	5216.75	-1556.75
8	7 - 8	25.0	1500	5160	745.25	5962.00	-802.00
9	8 - 9	31.0	1860	7020	745.25	6707.25	312.75
10	9 - 10	27.5	1650	8670	745.25	7452.50	1217.50
11	10 - 11	24.0	1440	10110	745.25	8197.75	1912.25
12	11 - 12	20.0	1200	11310	745.25	8943.00	2367.00
13	12 - 13	21.0	1260	12570	745.25	9688.25	2881.75
14	13 - 14	19.0	1140	13710	745.25	10433.50	3276.50
15	14 - 15	15.0	900	14610	745.25	11178.75	3431.25
16	15 - 16	10.0	600	15210	745.25	11924.00	3286.00
17	16 - 17	6.5	390	15600	745.25	12669.25	2930.75
18	17 - 18	7.6	456	16056	745.25	13414.50	2641.50
19	18 - 19	7.2	432	16488	745.25	14159.75	2328.25
20	19 - 20	6.8	408	16896	745.25	14905.00	1991.00
21	20 - 21	5.5	330	17226	745.25	15650.25	1575.75
22	21 - 22	4.5	270	17496	745.25	16395.50	1100.50
23	22 - 23	3.5	210	17706	745.25	17140.75	565.25
24	23 - 24	3.0	180	17886	745.25	17886.00	0.00

Avg. flow = 745.25 m^3/hr

Volume = 3431.25 + 2011.5 = 5442.75