Free report on trial 1

Sociology, Social Issues

Assignment

Calculate the theoretical discharge for each trial using Eqn. 5.

Replacing all the values

= 5. 4 * 6 * 9. 81/2 * (2/3)3/2 * 1. 53/2

= 36. 69

Trial 2:

Replacing all the values

= 5. 3 * 6 * 9. 81/2 * (2/3)3/2 * 1. 753/2

= 61. 86

Trial 3:

Replacing all the values

= 5. 2 * 6 * 9. 81/2 * (2/3)3/2 * 23/2

= 90. 59

Trial 4:

Replacing all the values

= 5. 1 * 6 * 9. 81/2 * (2/3)3/2 * 2. 253/2

= 126. 51

Trial 5:

Replacing all the values

= 5. 04 * 6 * 9. 81/2 * (2/3)3/2 * 2. 53/2

= 171. 5

Trial 6:

Replacing all the values

= 4. 97 * 6 * 9. 81/2 * (2/3)3/2 * 2. 753/2

= 225. 09

Trial 7:

Replacing all the values

= 4. 89 * 6 * 9. 81/2 * (2/3)3/2 * 33/2

= 287. 53

Trial 8:

Replacing all the values

= 4. 83 * 6 * 9. 81/2 * (2/3)3/2 * 3. 253/2

= 361. 1

Calculate Cwd for each trial using Eqn. 6.

h = (y1 – p)

7. 5 – 6

= 1. 5

Therefore,

Cwd= 0. 65 / (√(1+h/p)

Replacing for h and p

= 0. 65 / √ (1 + 1. 5/6)

= 5. 4

Trial 2:

h = (y1 – p)

7. 75 – 6

= 1. 75

Therefore,

Cwd= 0. 65 / (√(1+h/p)

Replacing for h and p

= 0. 65 / √ (1 + 1. 75/6)

= 5. 3

Trial 3:

h = (y1 – p)

8 – 6

= 2

Therefore,

Cwd= 0. 65 / (√(1+h/p)

Replacing for h and p

= 0. 65 / √ (1 + 2/6)

= 5. 2

Trial 4:

h = (y1 – p)

8. 25 – 6

= 2. 25

Therefore,

Cwd= 0. 65 / (√(1+h/p)

Replacing for h and p

= 0. 65 / √ (1 + 2. 25/6)

= 5. 1

Trial 5:

h = (y1 – p)

8. 5 – 6

= 2. 5

Therefore,

Cwd= 0. 65 / (√(1+h/p)

Replacing for h and p

= 0. 65 / √ (1 + 2. 5/6)

= 5. 04

Trial 6:

h = (y1 – p)

8. 75 – 6

= 2. 75

Therefore,

Cwd= 0. 65 / (√(1+h/p)

Replacing for h and p

= 0. 65 / √ (1 + 2. 75/6)

= 4. 97

Trial 7:

h = (y1 – p)

9 – 6

= 3

Therefore,

Cwd= 0. 65 / (√(1+h/p)

Replacing for h and p

= 0. 65 / √ (1 + 3/6)

= 4. 89

Trial 8:

h = (y1 – p)

9. 25 – 6

= 3. 25

Therefore,

Cwd= 0. 65 / (√(1+h/p)

Replacing for h and p

= 0. 65 / √ (1 + 3. 25/6)

= 4. 83

Calculate the experimental discharge for each trial using Eqn. 1a.

Replacing the values

= 6 * (9. 8 * 0. 43)1/2

= 1. 8816

Trial 2:

Replacing the values

= 6 * (9. 8 * 0. 753)1/2

= 12. 4

Trial 3:

Replacing the values

= 6 * (9. 8 * 0. 93)1/2

= 21. 43

Trial 4:

Replacing the values

= 6 * (9. 8 * 1. 13)1/2

= 39. 13

Trial 5:

Replacing the values

= 6 * (9. 8 * 1. 53)1/2

= 99. 225

Trial 6:

Replacing the values

= 6 * (9. 8 * 1. 63)1/2

= 120. 42

Trial 7:

Replacing the values

= 6 * (9. 8 * 1. 93)1/2

= 201. 65

Trial 8:

Replacing the values

= 6 * (9. 8 * 2. 13)1/2

= 272. 27

Calculate the yc for each trial using Eqn. 1a.

Trial 1:

yc= (q2/ g)1/3 and q = (Q / b)

Therefore,

yc= ((Q / b)2/ g)1/3

Replacing the values

= ((1. 8816/ 6)2/ 9. 8)1/3

= 0. 4

Trial 2:

yc= ((Q / b)2/ g)1/3

Replacing the values

= ((12. 4/ 6)2/ 9. 8)1/3

= 0. 75

Trial 3:

yc= ((Q / b)2/ g)1/3

Replacing the values

= ((21. 43/ 6)2/ 9. 8)1/3

= 0. 9

Trial 4:

yc= ((Q / b)2/ g)1/3

Replacing the values

= ((39. 13 / 6)2/ 9. 8)1/3

= 1. 1

Trial 5:

yc= ((Q / b)2/ g)1/3

Replacing the values

= ((99. 225/ 6)2/ 9. 8)1/3

= 1. 5

Trial 6:

yc= ((Q / b)2/ g)1/3

Replacing the values

= ((120. 42/ 6)2/ 9. 8)1/3

= 1. 6

Trial 7:

yc= ((Q / b)2/ g)1/3

Replacing the values

= ((201. 65/ 6)2/ 9. 8)1/3

= 1. 9

Trial 8:

yc= ((Q / b)2/ g)1/3

Replacing the values

= ((272. 27/ 6)2/ 9. 8)1/3

= 2. 1

Graphs:

Below is a plot showing the relationship between Qtheo and measured yc

Chart 1: Qtheo vs. measured yc

Qtheo = 141. 52 (measured yc)

Below is a chart showing the relationship between y1 and the calculated yc.

Chart 2: y1 vs calculated yc

y1 = 1. 0324 (calculated yc) + 7. 0522

Chart 3: Qexp vs. Qtheo

Qexp = 0. 6454 (Qtheo)

Energy Grade Line Diagram

The diagram below shows the energy grade line diagram. From the diagram below the energy grade lines are dotted.

Discussion:

The second relationship from the charts is y1 = 1. 0324 (calculated yc) + 7. 0522. This shows that there is a positive relationship between the value of y1 and the distance yc. This indicates that as y1 increases so does yc and vice versa.

Lastly, the third relationship from the charts is Qexp = 0. 6454 (Qtheo). This relationship also indicates that there is a significant difference between the theoretical value of Q and its experimental value.

The results obtained make sense. They are consistent with what is expected. A broad-crested weir is defined as an obstruction that is located at an end of an open channel that is used to determine the flow of fluid in the channel. The discharge from the open channel is either dependent on the critical depth over the weir or the height of the upstream flow. From the experiment, these results are evident since it is clear that discharge from the open channel has a direct relationship with the critical depth over the weir or the height of the upstream flow.

The following are the possible sources of error while conducting the experiment:

- Poor apparatus calibration leading to equipment and apparatus errors while collecting measurements in the laboratory
- Calculation errors while analyzing the data provided
- Errors resulting from rounding off or truncating values obtained from

calculations

- Parallax errors while reading the measuring equipment used in the laboratory

Results

The table shown below shows the results obtained from the experiment. The results recorded are for the 10 trials conducted in the laboratory.

Table 1: Results obtained from the laboratory