Important Open Rectangular Basin and Seiches Formulas PDF

Formulas
Examples
with Units

List of 8
Important Open Rectangular Basin and Seiches Formulas

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1) Length of Basin for Open Rectangular Basin Formula

Formula

$$l_B = T_n \cdot \left(1 + \left(2 \cdot N\right)\right) \cdot \sqrt{\frac{[g] \cdot D}{4}}$$

Example with Units

$$53.6978_m = 5.5_s \cdot \left(1 + \left(2 \cdot 1.3\right)\right) \cdot \sqrt{\frac{9.8066_{m/s^2} \cdot 12_m}{4}}$$

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2) Length of Basin given Natural Free Oscillating Period of Basin Formula

Formula

$$l_B = \frac{T_n \cdot N \cdot \sqrt{[g] \cdot D}}{2}$$

Example with Units

$$38.7817_m = \frac{5.5_s \cdot 1.3 \cdot \sqrt{9.8066_{m/s^2} \cdot 12_m}}{2}$$

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3) Natural Free Oscillating Period of Basin Formula

Formula

$$T_n = \frac{2 \cdot l_B}{N \cdot \sqrt{[g] \cdot D}}$$

Example with Units

$$5.5_s = \frac{2 \cdot 38.782_m}{1.3 \cdot \sqrt{9.8066_{m/s^2} \cdot 12_m}}$$

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4) Natural Free Oscillating Period of Basin for Open Rectangular Basin Formula

Formula

$$T_n = 4 \cdot \frac{l_B}{\left(1 + \left(2 \cdot N\right)\right) \cdot \sqrt{[g] \cdot D}}$$

Example with Units

$$3.9723_s = 4 \cdot \frac{38.782_m}{\left(1 + \left(2 \cdot 1.3\right)\right) \cdot \sqrt{9.8066_{m/s^2} \cdot 12_m}}$$

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5) Number of Nodes along Axis of Basin for Open Rectangular Basin Formula ⤤

Formula

$$N = \frac{\left(4 \cdot \frac{l_B}{T_n \cdot \sqrt{[g] \cdot D}}\right) - 1}{2}$$

Example with Units

$$0.8 = \frac{\left(4 \cdot \frac{38.782\,\text{m}}{5.5\,\text{s} \cdot \sqrt{9.8066\,\text{m/s}^2 \cdot 12\,\text{m}}}\right) - 1}{2}$$

6) Number of Nodes along Axis of Basin given Natural Free Oscillating Period of Basin Formula ⤤

Formula

$$N = \frac{2 \cdot l_B}{T_n \cdot \sqrt{[g] \cdot D}}$$

Example with Units

$$1.3 = \frac{2 \cdot 38.782\,\text{m}}{5.5\,\text{s} \cdot \sqrt{9.8066\,\text{m/s}^2 \cdot 12\,\text{m}}}$$

7) Water Depth for Open Rectangular Basin Formula ⤤

Formula

$$D = \frac{\left(4 \cdot \frac{l_B}{T_n \cdot (1 + 2 \cdot (N))}\right)^2}{[g]}$$

Example with Units

$$6.2594\,\text{m} = \frac{\left(4 \cdot \frac{38.782\,\text{m}}{5.5\,\text{s} \cdot (1 + 2 \cdot (1.3))}\right)^2}{9.8066\,\text{m/s}^2}$$

8) Water Depth given Natural Free Oscillating Period of Basin Formula ⤤

Formula

$$D = \frac{\left(2 \cdot \frac{l_B}{T_n \cdot N}\right)^2}{[g]}$$

Example with Units

$$12.0002\,\text{m} = \frac{\left(2 \cdot \frac{38.782\,\text{m}}{5.5\,\text{s} \cdot 1.3}\right)^2}{9.8066\,\text{m/s}^2}$$

Variables used in list of Open Rectangular Basin and Seiches Formulas above

- **D** Water Depth *(Meter)*
- **l_B** Length of the Basin *(Meter)*
- **N** Number of Nodes along the Axis of a Basin
- **T_n** Natural Free Oscillating Period of a Basin *(Second)*

Constants, Functions, Measurements used in list of Open Rectangular Basin and Seiches Formulas above

- constant(s): **[g]**, 9.80665
  Gravitational acceleration on Earth
- Functions: **sqrt**, sqrt(Number)
  A square root function is a function that takes a non-negative number as an input and returns the square root of the given input number.
- Measurement: **Length** in Meter (m)
  Length Unit Conversion 📤
- Measurement: **Time** in Second (s)
  Time Unit Conversion 📤

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