DESIGN OF STEP AERATOR

Final Treated Water Demand = 180,000 m³/day
Design Demand = 189,000 m³/day

Assume

No of Drops = 5 Nr
Height of Drop = 400 mm
Flow Rate, \( q = 0.01 \) m³/S over m of step
Cascade Area = 2 m²/m³/min
width of Step = 400 mm

Area of Aerator = 262.50 m²
Total width of aerator = 2.00 m
Length of the aerator = 131.25 m
Length of a step = 26.25 m

Height of Drop = 400 mm
Height of weir = 150 mm
Height of Aerator = 2.00 m

FLOW VELOCITY

Flow = 2.19 m³/s
Flow Over weir = \( 1.833 \times B \times H^{(3/2)} \)
\( H_0 = 0.127 \) m

The velocity of the flow = 0.654 m/s
Total Contact Time with Air = 3.06 S
131.25 m³/min or 2.19 m³/s

<table>
<thead>
<tr>
<th>Recommended Values</th>
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</thead>
<tbody>
<tr>
<td>No of Drops</td>
<td>4-6</td>
<td>Nr</td>
</tr>
<tr>
<td>Height of Drops</td>
<td>30-60 cm</td>
<td></td>
</tr>
<tr>
<td>Height of Aerator</td>
<td>2-3 m</td>
<td></td>
</tr>
<tr>
<td>Flow Rate</td>
<td>0.01 m³/second over m of step</td>
<td></td>
</tr>
<tr>
<td>Cascade Area</td>
<td>A/Q 2</td>
<td>m²/m³/min</td>
</tr>
</tbody>
</table>

0.01*

1.3125 m³ over 1e

127 mm