



BENCH SCALE TESTING FOR PARALLEL PLATE CLARIFIER GRAVITY SETTLERS SIZE AND LOADING CALCULATIONS

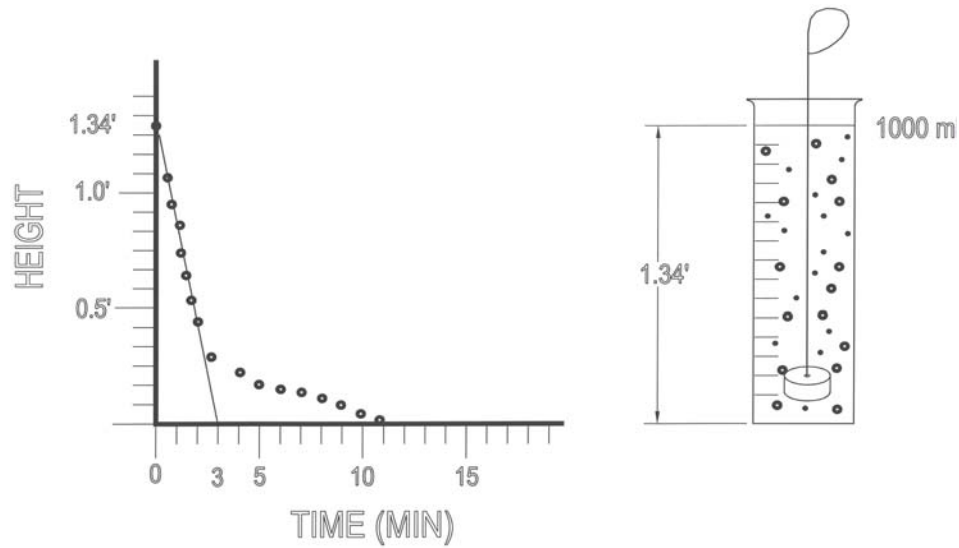
Items Needed:

- 1) One (1) 1000 ml graduated cylinder, clear, with markings.
- 2) One (1) undersized rubber stopper (capable of easily sliding up and down the inside of the graduated cylinder) connected to stiff wire.
- 3) Two (2) 500 ml beakers with a stirring mechanism, or one (1) 1000 ml beaker with a stirring mechanism.
- 4) Pre-diluted Polymer.
- 5) One (1) 0-10 ml syringe or pipette.
- 6) At least 1000 ml of sample solution.

Process:

- 1) Fill each of the 500 ml beakers, or one (1) 1000 ml beaker to the high mark with the sample solution. Turn on the flash mix stirrer to a manageable speed.
- 2) Add 1.5 ml of the polymer to each of the 500 ml sample solutions, or 3 ml to the 1000 ml sample solution.
- 3) Continue to allow flash mix for two (2) minutes.
- 4) Turn off the stirrer and pour the solution into the graduated cylinder. Flocculate the solution by gently raising and lowering the stopper inside the cylinder (about 3 seconds per each stroke each way).
- 5) Continue flocculating for approximately ten (10) minutes.
- 6) Remove the plunger and immediately start stopwatch. Record ml interface level as solids settle. Suggested readings are 15 seconds, 30 seconds, 45 seconds, 1

minute, 2 minutes, 3 minutes, 4 minutes, 5 minutes, 8 minutes, 10 minutes, and 15 minutes. Change ml reading to height in feet from bottom of cylinder. For example: 1000 ml = 1.34', 100 ml = 0.134', 10 ml = 0.0134'. Plot results, height vs. time. See Figure #1



(FIGURE #1)

- 7) Extend the straight line for the settling portion starting at the 1.34' – 0 minute point and ending on the time line. In this example, the bulk-settling rate is 1.34' in 3 minutes. Multiply this feet/min by 7.481 to obtain the gpm/ft².
- 8) Divide the result by 2 for continuous flow rate. $(3.34 / 2) = 1.67$ gpm/ft². In general, despite results, do not use higher than 1.2 gpm/ft² for actual operation, therefore, the rate is 1.2 gpm/ft². Assume flow rate of 100 gpm. Rise area required is $(100 / 1.2) = 88.3$ ft² of required effective settling area. Round this up and use the closest model number unit. In this example, the closest model unit is a Model PPC-90-FMF.

Note: This effective settling area is the product of the horizontal projected plate area times the width of the plate times the number of plates.