

***Clarifiers:
Making What You Have
Work Better!***

**By:
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Clarifiers, Inc.
Enfield, NH**

Clarifier Configurations

- Basic Rectangular
- Gould Type II Rectangular
- Basic Circular (CFPO)
- Peripheral Feed (PF/PO)
- Peripheral Feed (Spiral Flow)
- Square

Always Think in Terms of the.....

- Flow Pattern !!!!
- Influent Structure
- Effluent Configuration
- Sludge Collection

Basic Rectangular

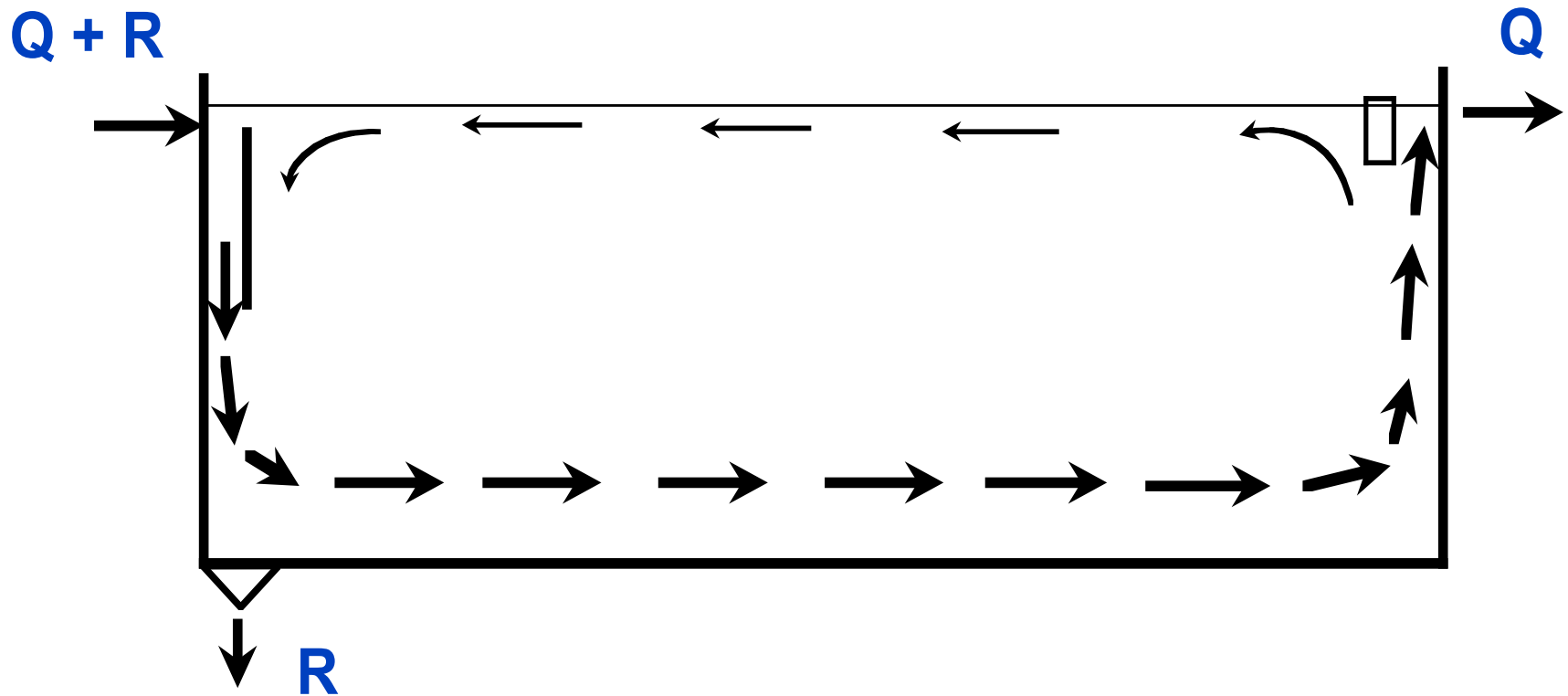
1. Balance Flows!!
2. Think BAFFLES!
3. Modify the launders
4. Modify the Influent Structure



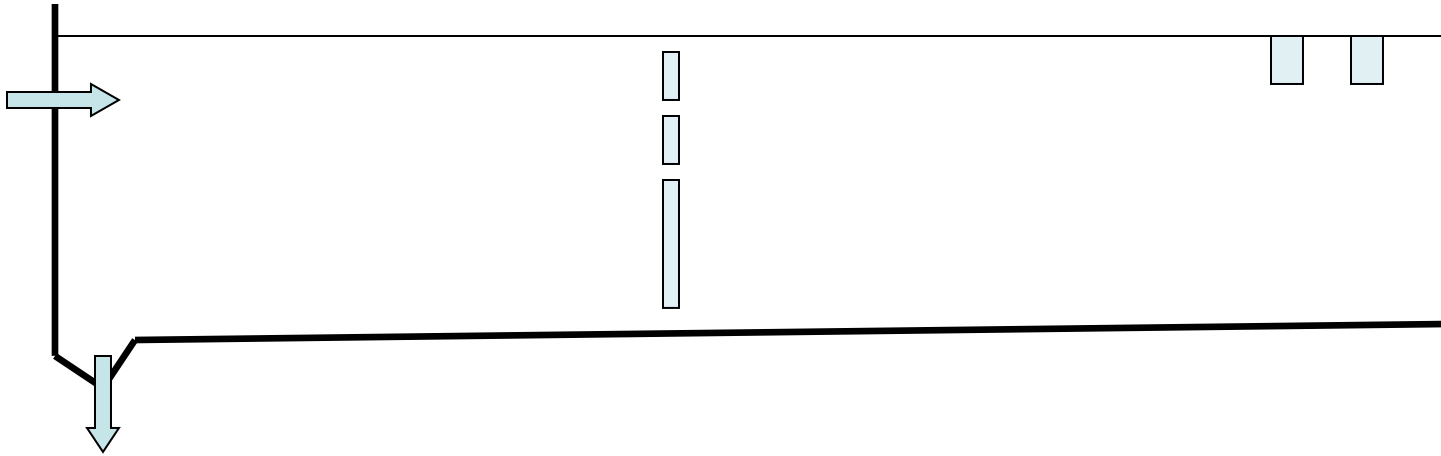




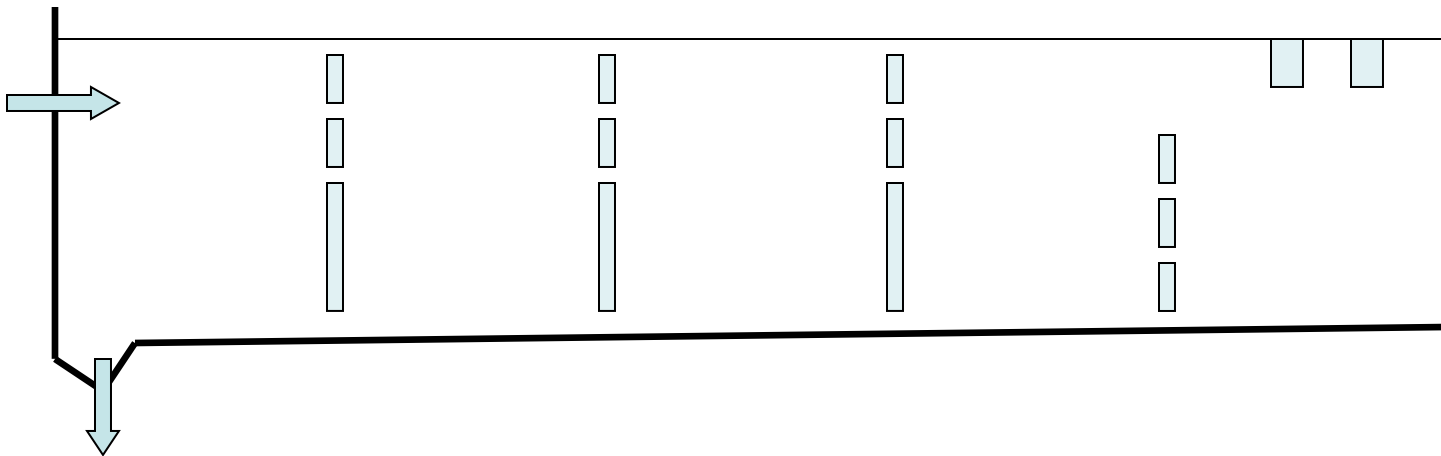
Typical Flow Pattern in a Rectangular Clarifier:



Single Mid-Tank Baffle



Multiple Baffles













Fairbanks (AK)





Golden Heart Test Baffle Locations

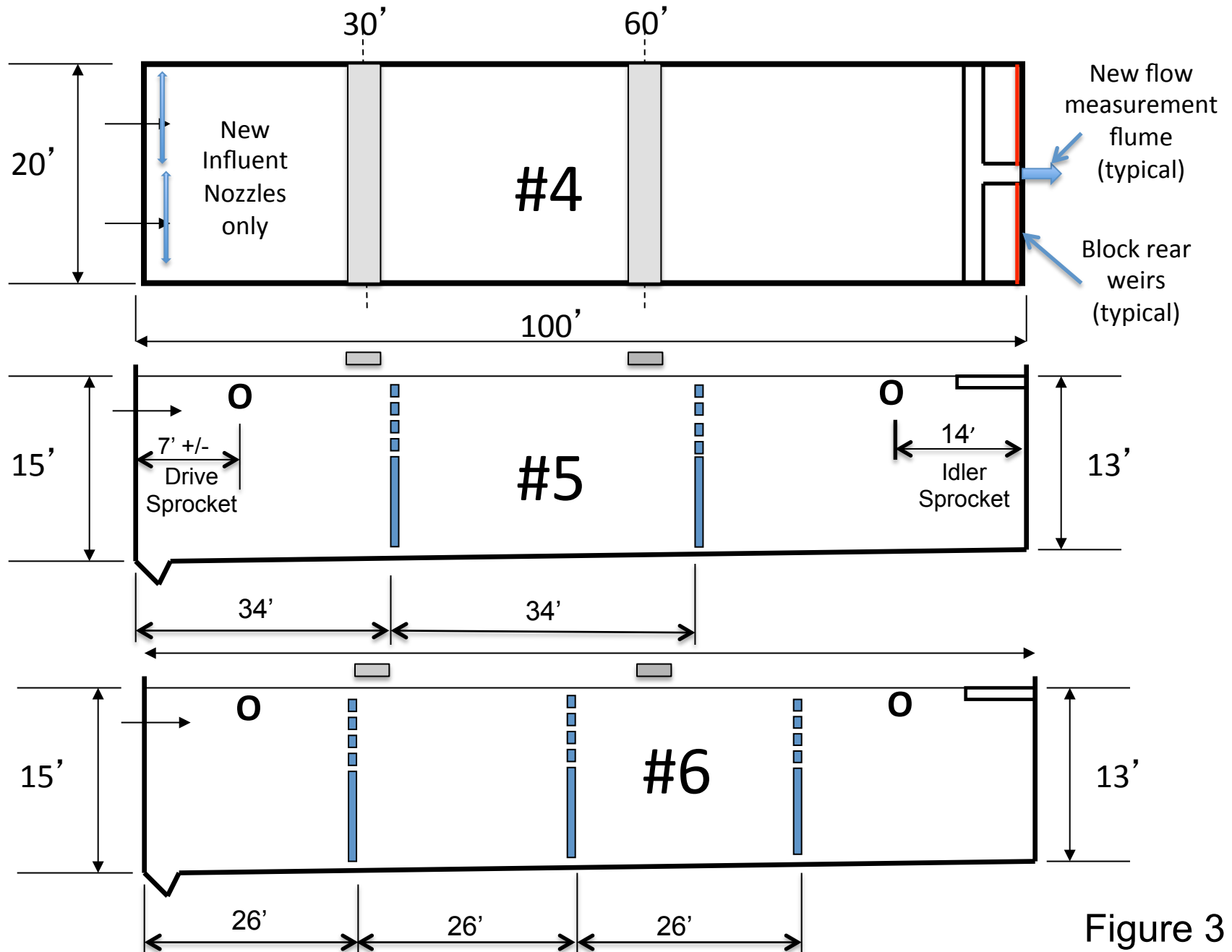


Figure 3

New Opposing Jet Inlets

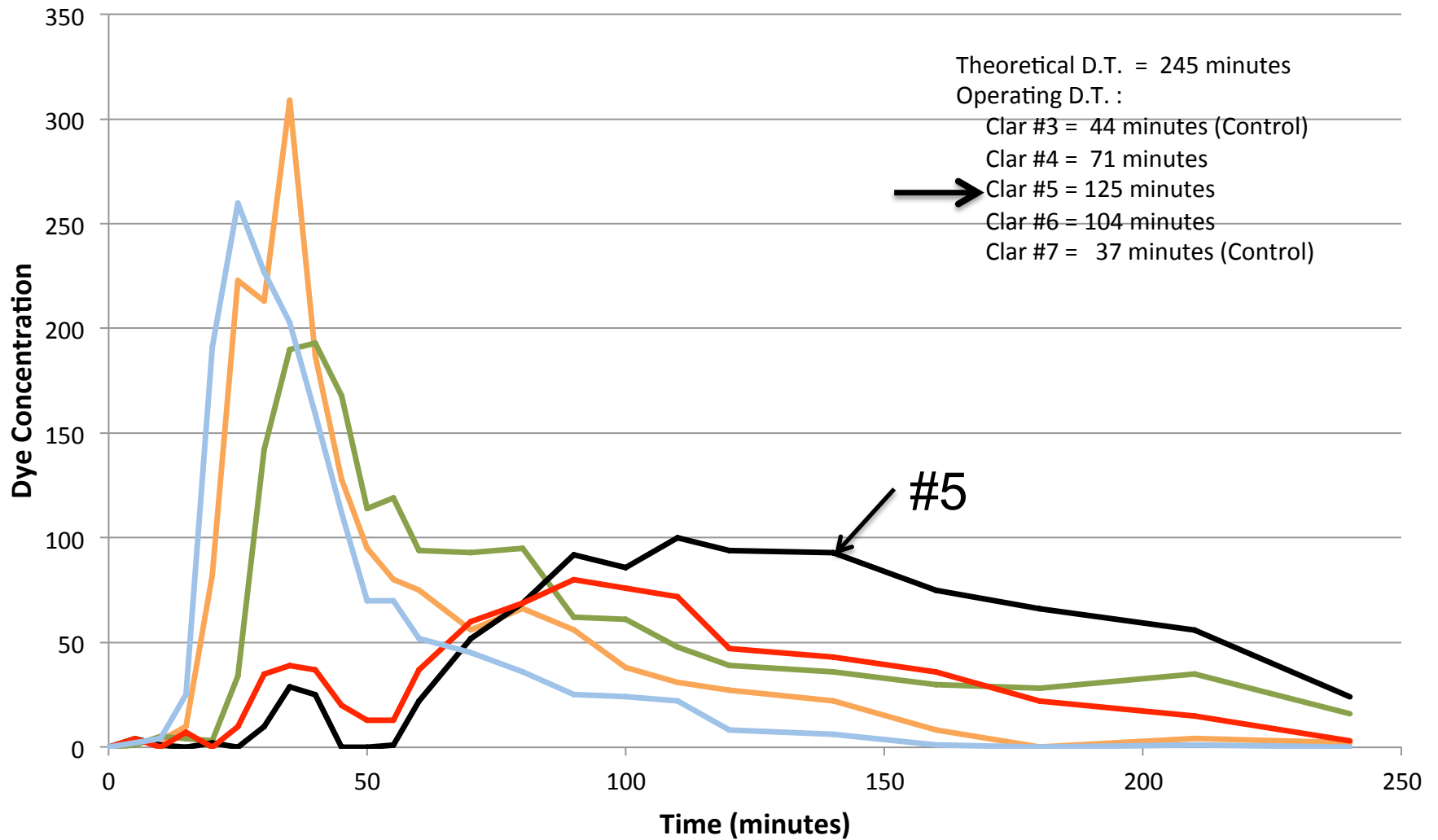


- New Intermediate Baffles



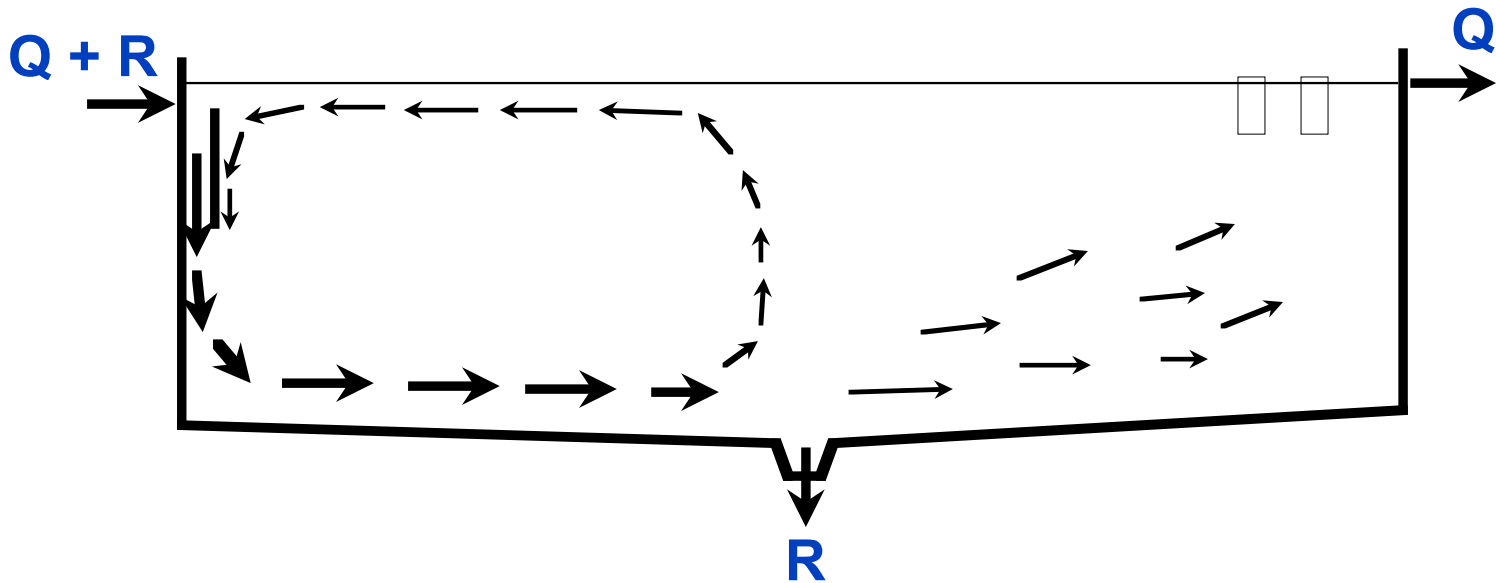
Clarifier Dye Curve Comparison at 1.3 mgd Flow Rate

SOR = 650 gal/sq ft/day

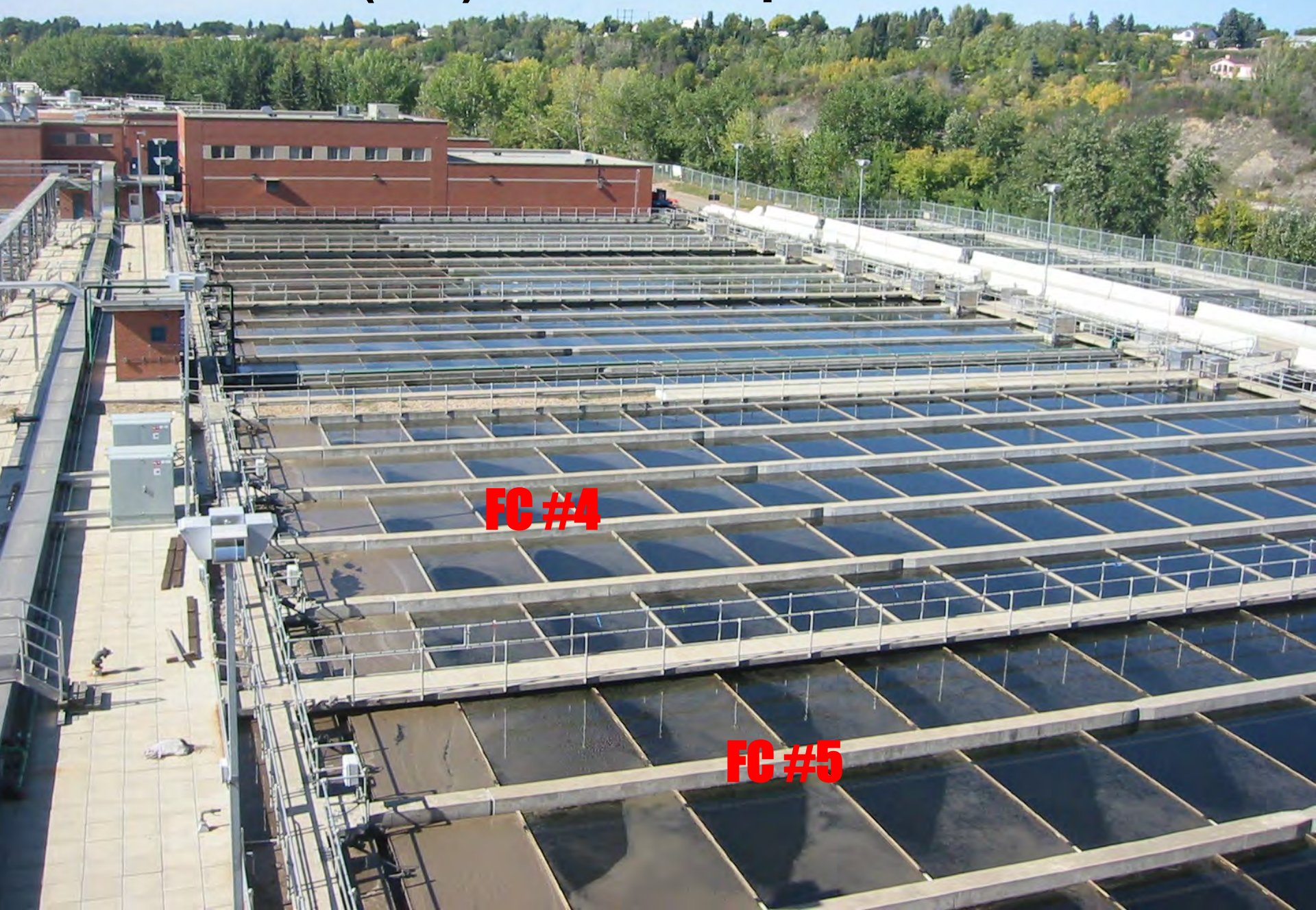


Clarifier 3 Clarifier 4 Clarifier 5 Clarifier 6 Clarifier 7

Typical Flow Pattern in a Gould Type II Clarifier:

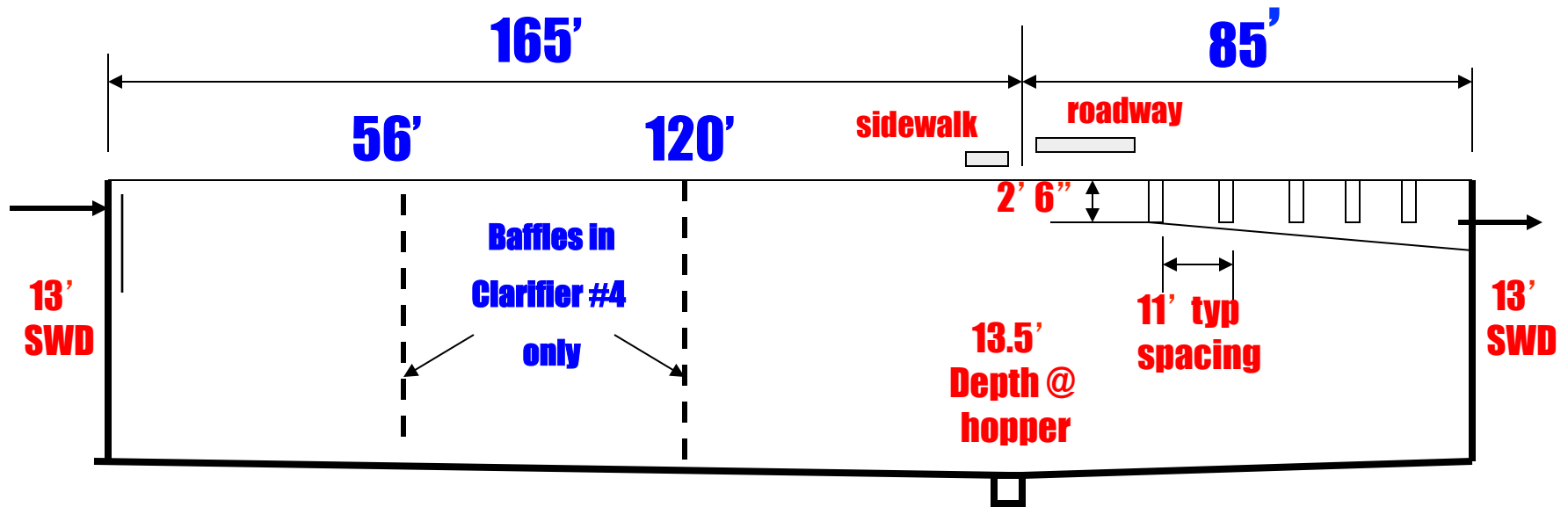


Edmonton (CA) Gold Bar plant



FC #4

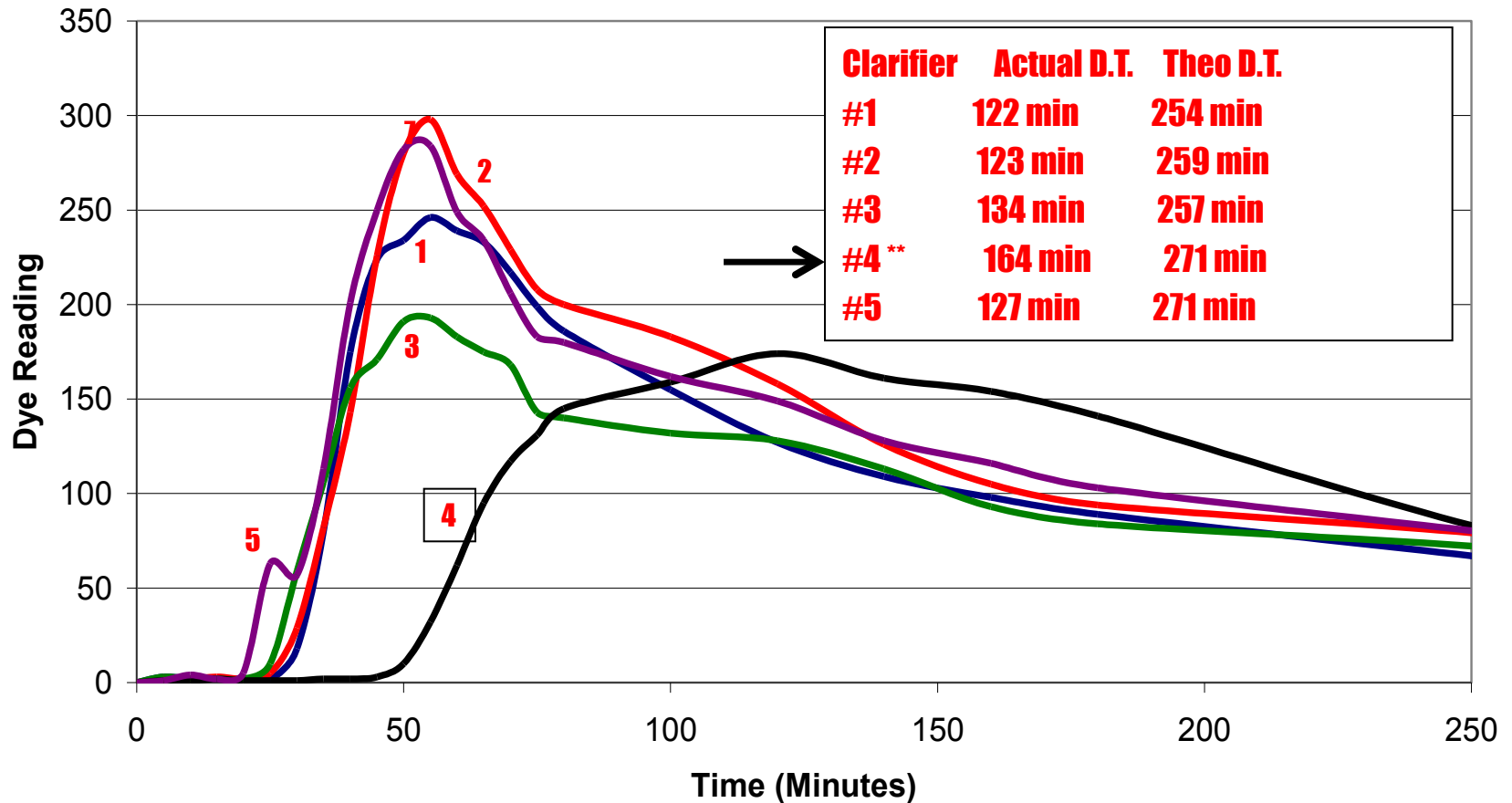
FC #5



Typical Cross-Section
Clarifiers #1 thru #5

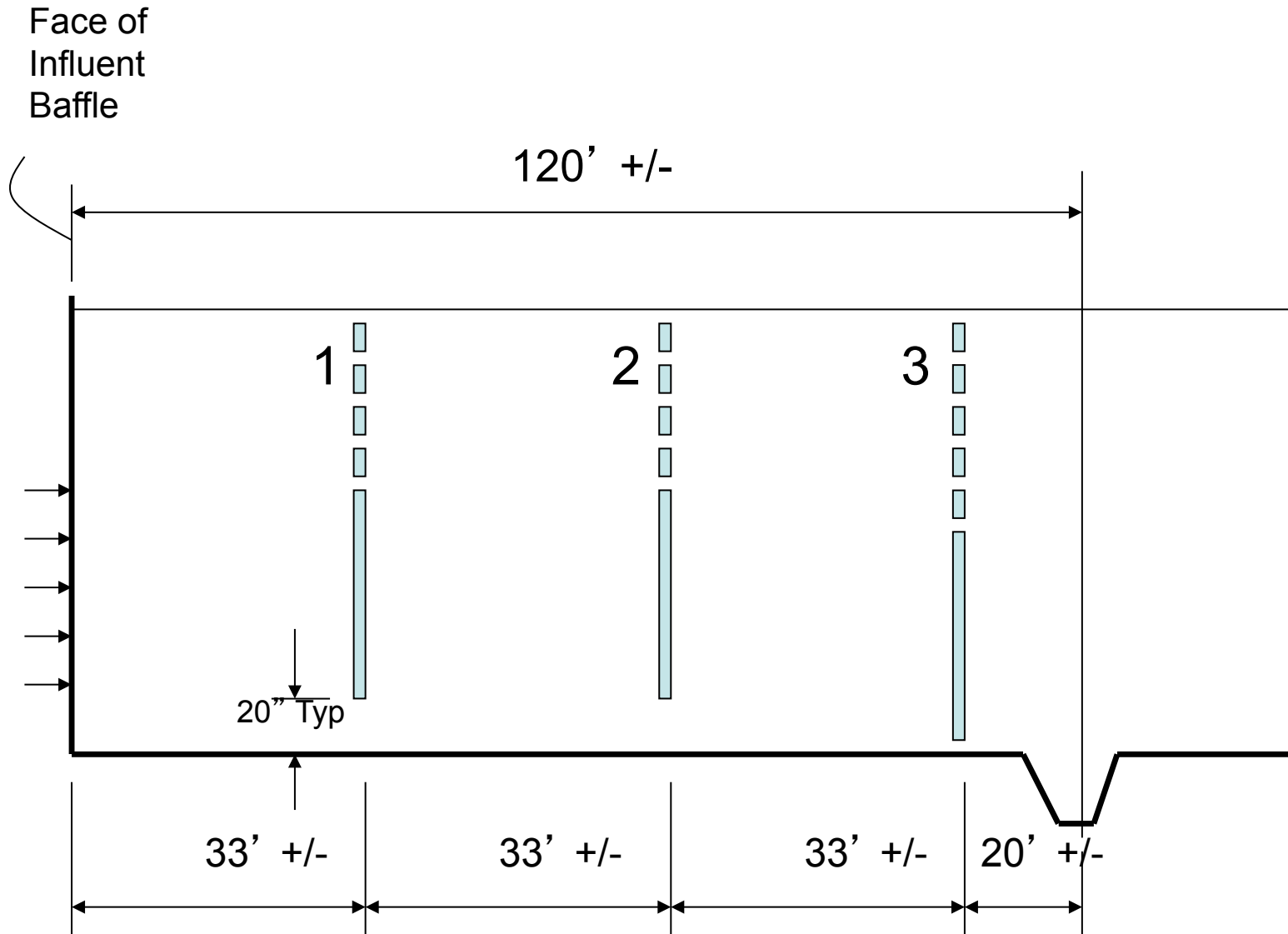


Clarifier 1 - 5 Detention Time Comparison at Normal Flow



— Clarifier 1 — Clarifier 2 — Clarifier 3 — Clarifier 4 — Clarifier 5

NYC-Wards Is. Recommended Baffle Locations





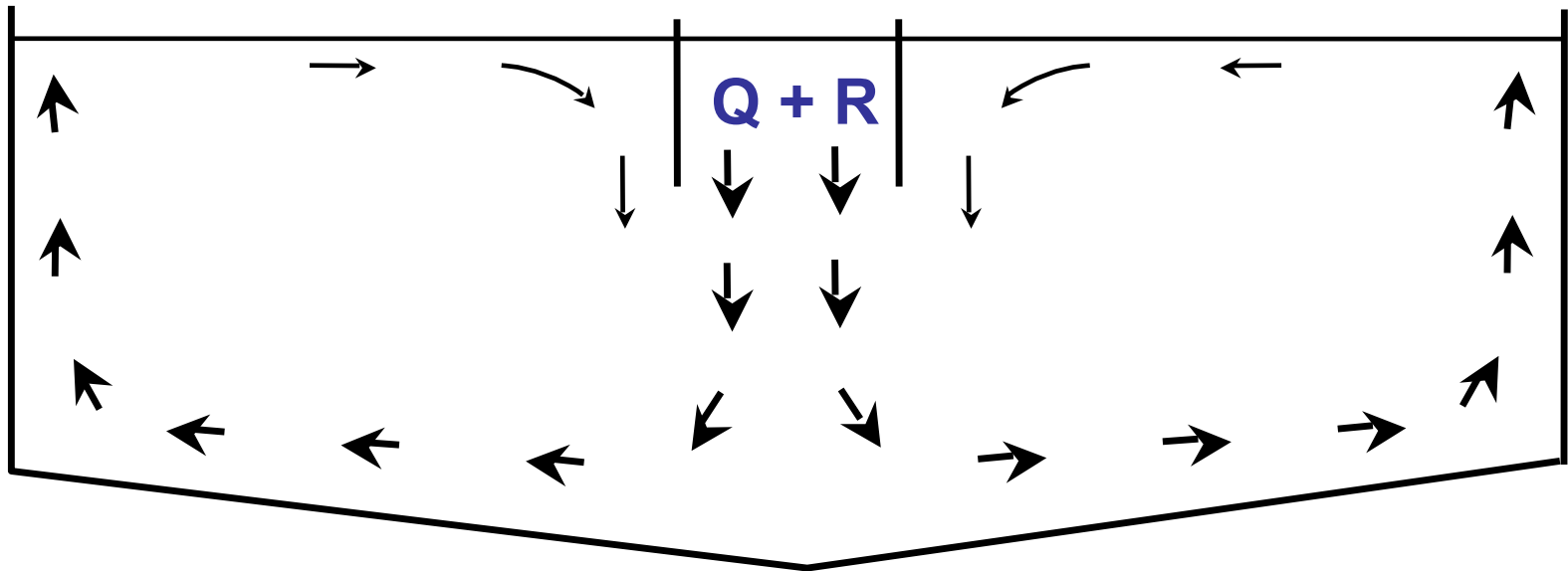
Basic Circular Clarifier:

- Balance Flows!
- Modify Launderers
- Modify Inlet
- Add Baffles?
- Improve Sludge Collection?



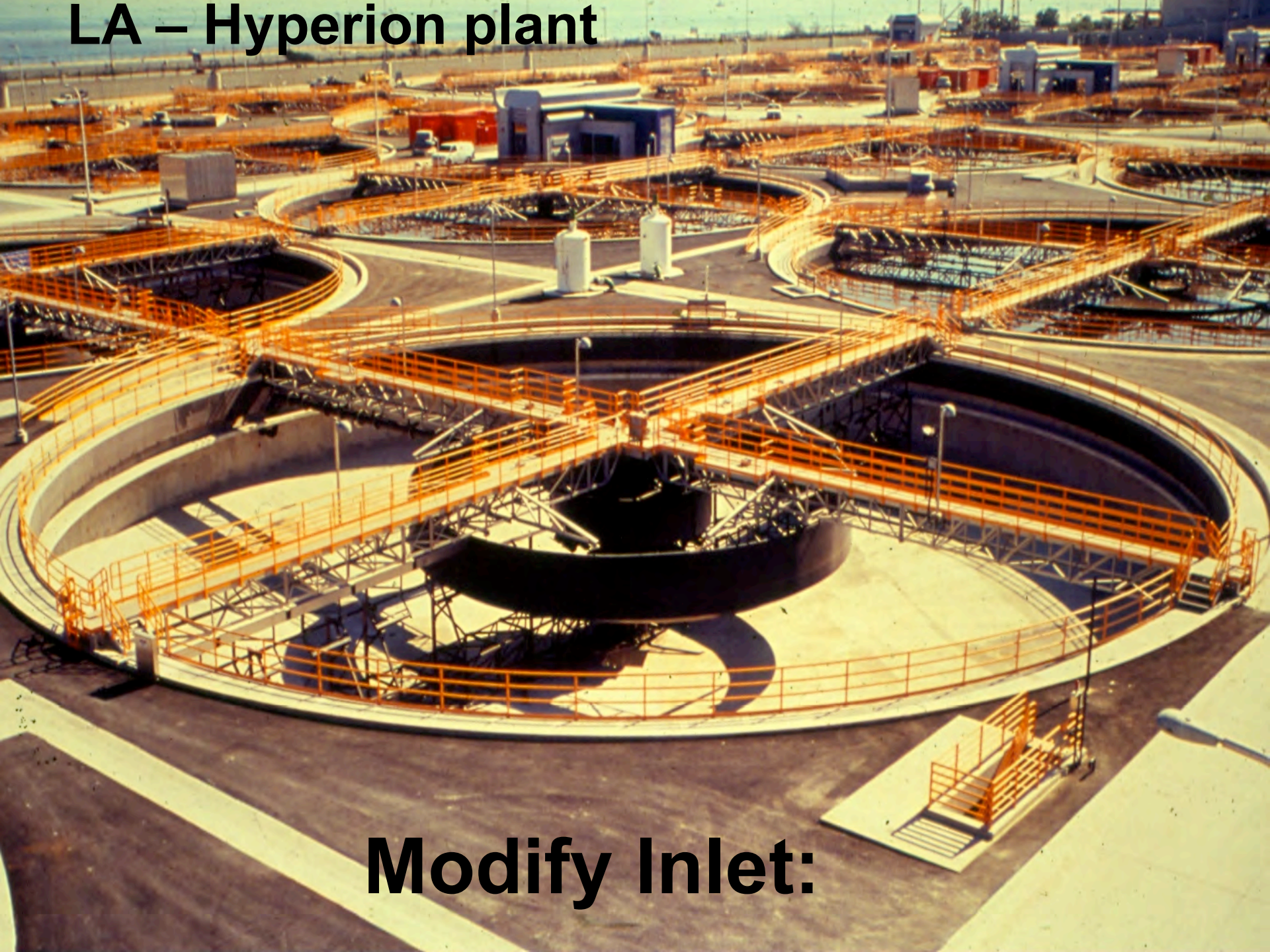


Typical Flow Pattern in a Circular A.S. Clarifier:





LA – Hyperion plant



Modify Inlet:

**We added a new
EDI with
“opposing jet”
nozzles to
Clarifier 3A**

**And gained at least
10 mgd MORE
capacity
per clarifier!!**

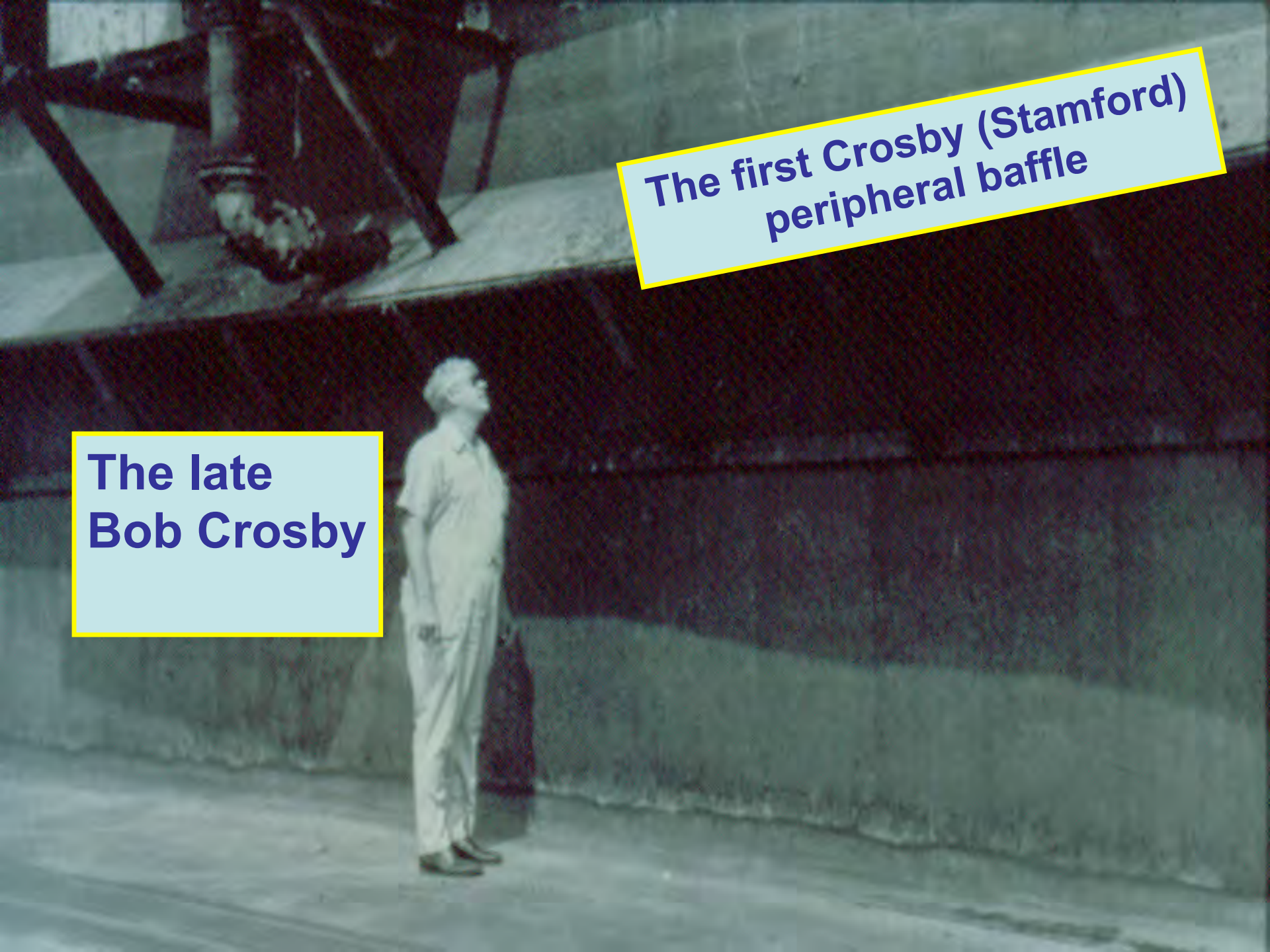


NYC-DEP Jamaica WWTP



Brockton, MA



A black and white photograph showing the side of a large ship's hull. A man, identified as Bob Crosby, stands on the deck in the lower center of the frame, looking up at the ship's structure. The hull is dark and has a light-colored horizontal band. In the upper left, a complex metal structure, identified as a peripheral baffle, is visible. Two text boxes with yellow borders are overlaid on the image: one in the upper right and one in the lower left.

**The first Crosby (Stamford)
peripheral baffle**

**The late
Bob Crosby**

**8-sided
Crosby Cylindrical Baffle
AKA the Kessler-Esler Baffle**

(Franklin, NH; New Haven, CT; Atlanta, GA; Jamaica, NYC)

Upper Blackstone

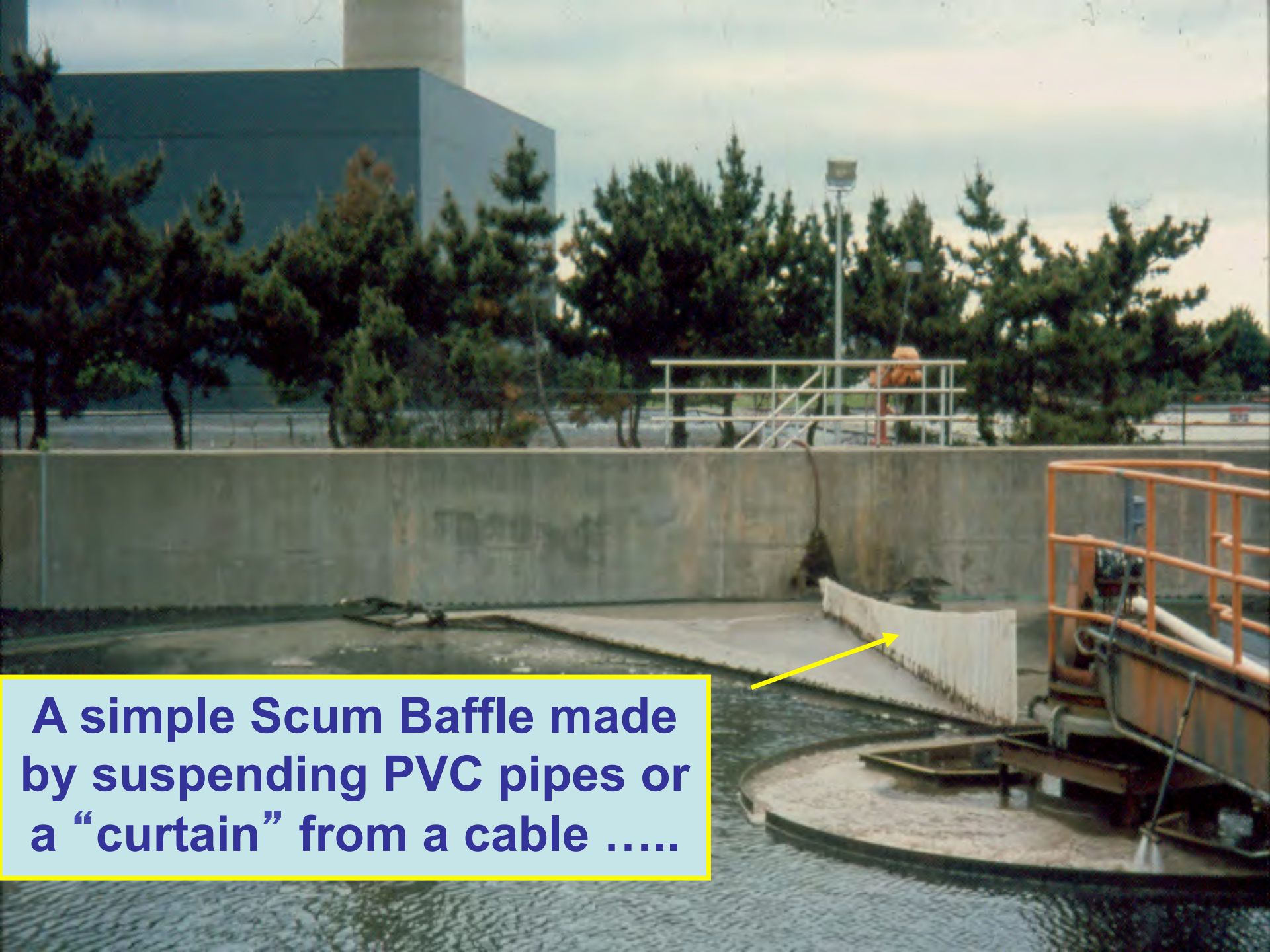




Norwalk, CT

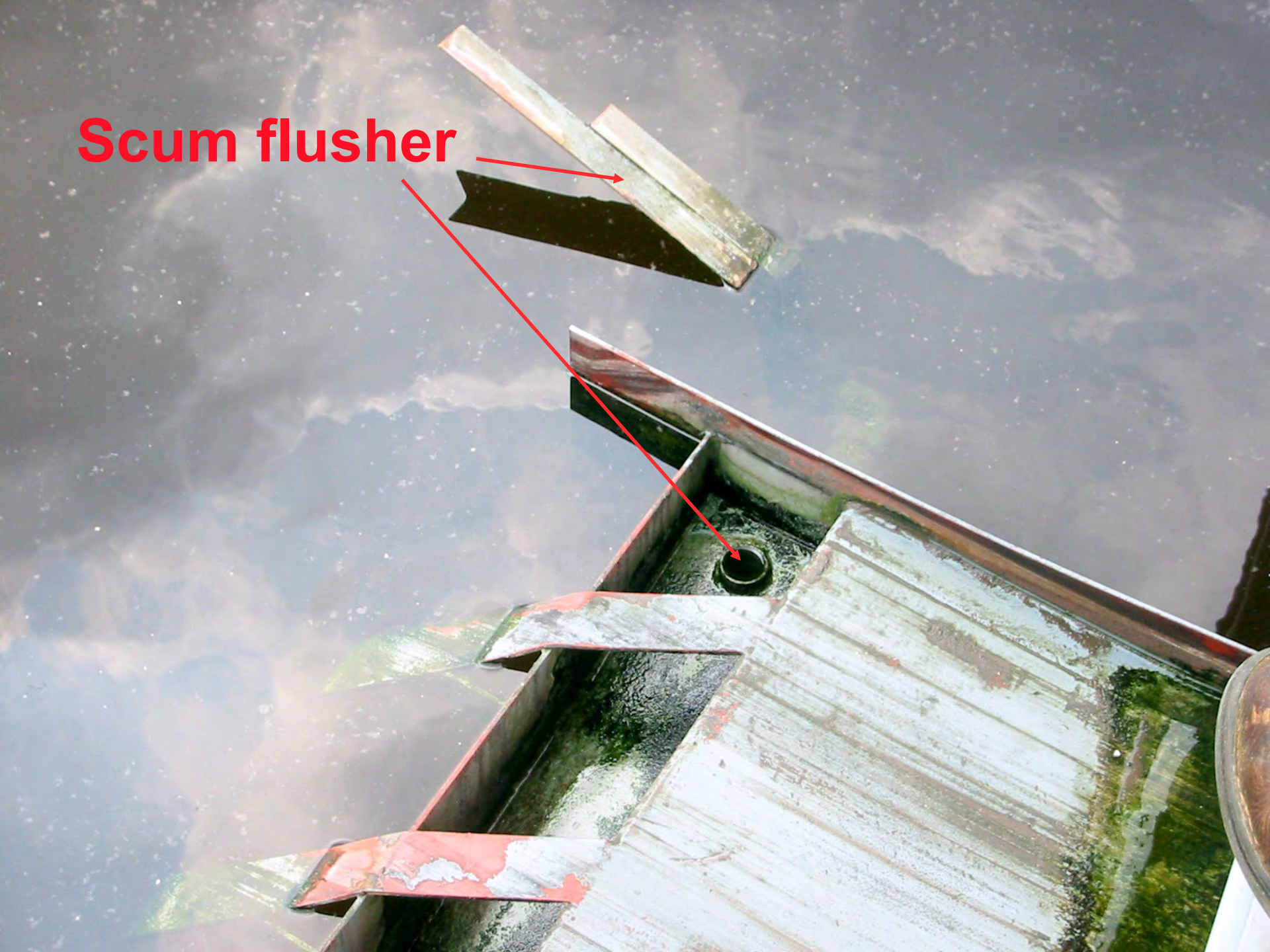






A simple Scum Baffle made by suspending PVC pipes or a “curtain” from a cable

Scum flusher





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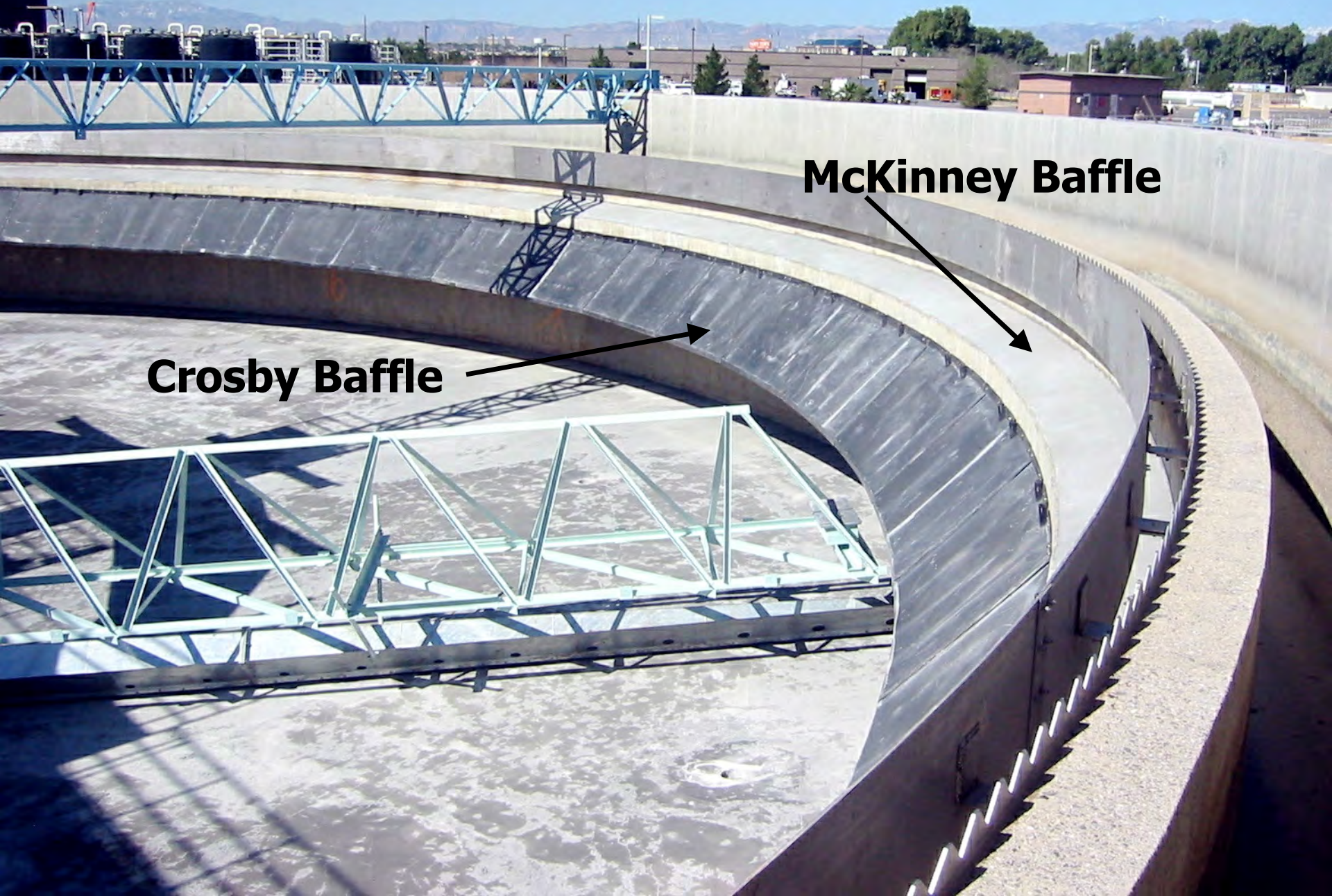
***Clarifiers:
Making What You Have
Work WORSE !!!***

Just a few examples

**The wrong
baffles**



Too much of a good thing!!



Crosby Baffle

McKinney Baffle



Miami-Dade South District





Too many weirs!!



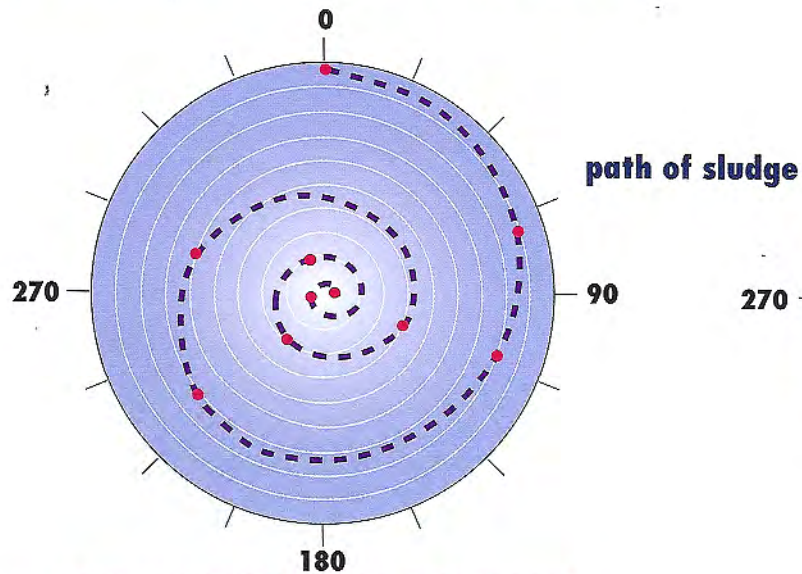
Submerged Centerwells?





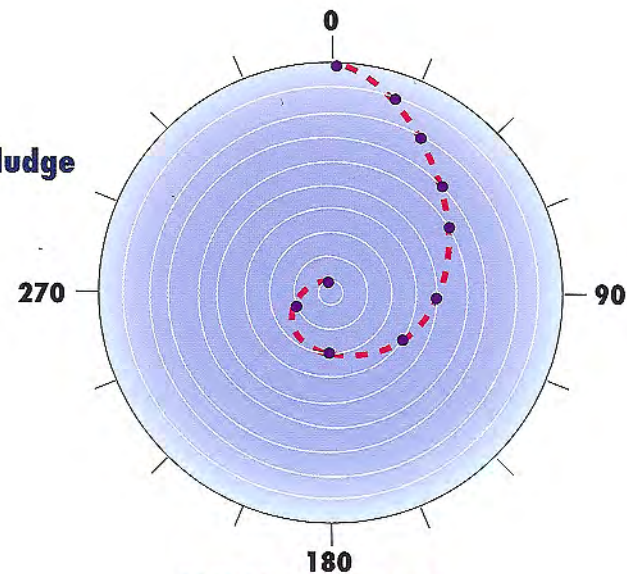


6. CUSTOMIZED SPIRAL RAKE BLADES



CONVENTIONAL SLUDGE TRANSPORT

Diameter = 200 ft
Tip Speed = 10 fpm
Time = 4.6 hours



SPIRAL TRANSPORT

Diameter = 200 ft
Tip Speed = 12.5 fpm
Time = 1.1 hours

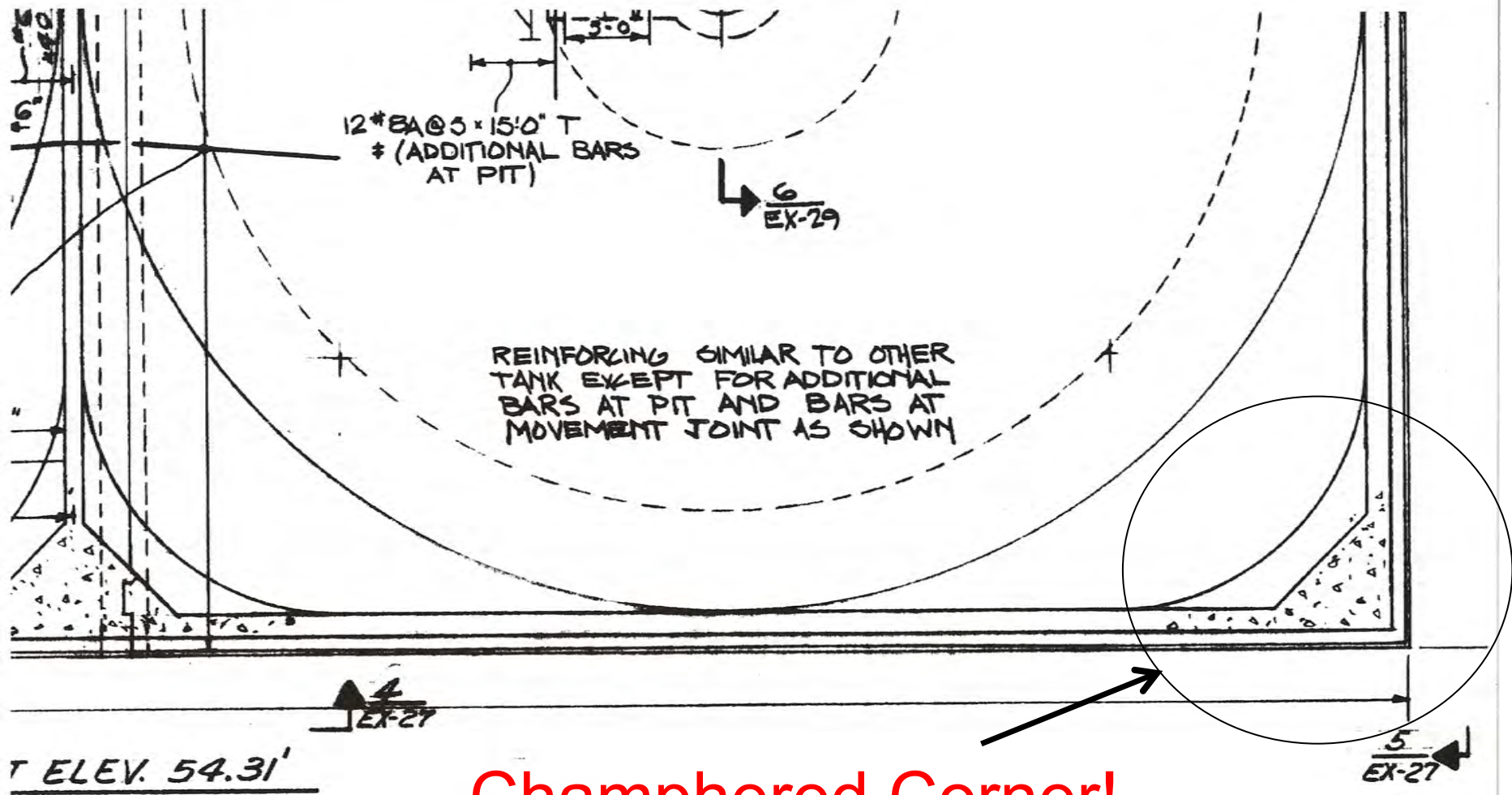
A tapered spiral blade rake arm can increase sludge transport capacity by four to five times over conventional segmented rakes.



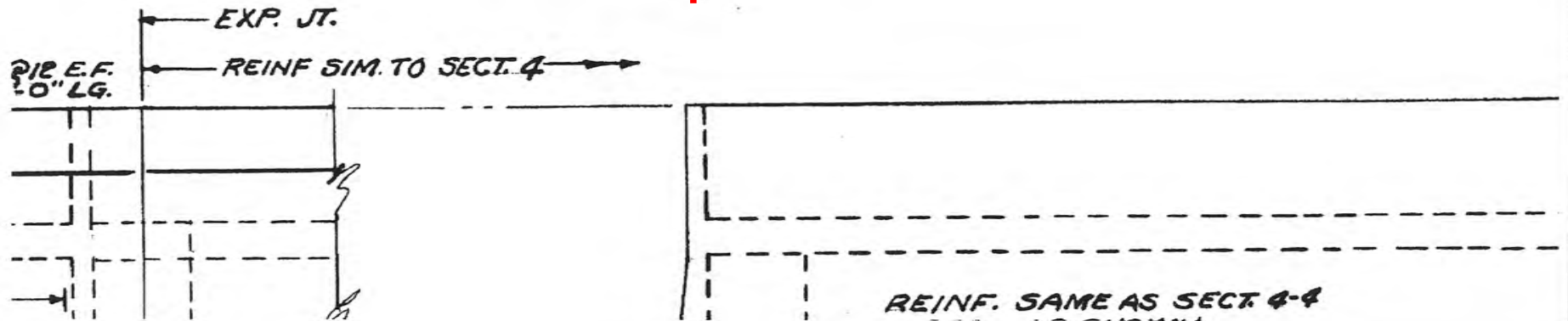
Chicopee, MA







Champhered Corner!



There's more to life than clarifiers!





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