MECH 450 - Papermaking
Approach Flow

Pulp and Paper Centre,
Department of Mechanical Engineering,
University of British Columbia

Approach Flow
Approach Flow

- **Machine Chest**
  - Last storage before papermachine

- **Consistency Control**
  - Dilution from white water chest

- **Tickler Refiner**
  - Light refining, eliminate bundles and flocs, some fibre modifications

---

Approach Flow

- **Stuff Box**
  - Provides constant pressure to papermachine

- **Basis weight meter and Valve**
  - Controls amount of fibre fed to papermachine

- **Fan Pump**
  - Large centrifugal pump delivers stock to papermachine
  - Consistency 0.5 to 1.0%
Approach Flow

- Cleaning and Screening
  - Mostly for protection but increasingly used to improve cleanliness
- Deculator
  - Chamber under vacuum
  - Remove air from stock

Approach Flow - Distributor

- Stock from pipe must be distributed across 10 m of papermachine evenly
- Must also straighten the flow
Approach Flow – Distributor

- Pipes are used to straighten flow
- Need to be 7-10 pipe diameters long
- Also use recirculation

White water system balance

- To better understand the wet-end of the papermachine and its response to changes we should examine a material balance across the machine
Typical values of the flow for an older machine are:
- Sewer flow: 200 m$^3$ / ton
- Concentration 1.5 kg/m$^3$
- Material lost is … 300 Kg/ton of paper.

For a modern machine:
- Sewer flow: 10 m$^3$ / ton
- Concentration 0.05 kg/m$^3$
- Material lost is … 0.5 Kg/ton of paper.

Retention

- Lets look at simple retention …
Retention

Short circulation - retention

Q_1 C_1

Q_2 C_2

Q_3 C_3

Q_4 C_4

Q_5 C_5

Short circulation

Long circulation
Unsteady approach flow

How long does it take for a grade change?
Unsteady approach flow

Q₀, C₀  →  Q₂, Cᵥ  →  Q₃, C₃