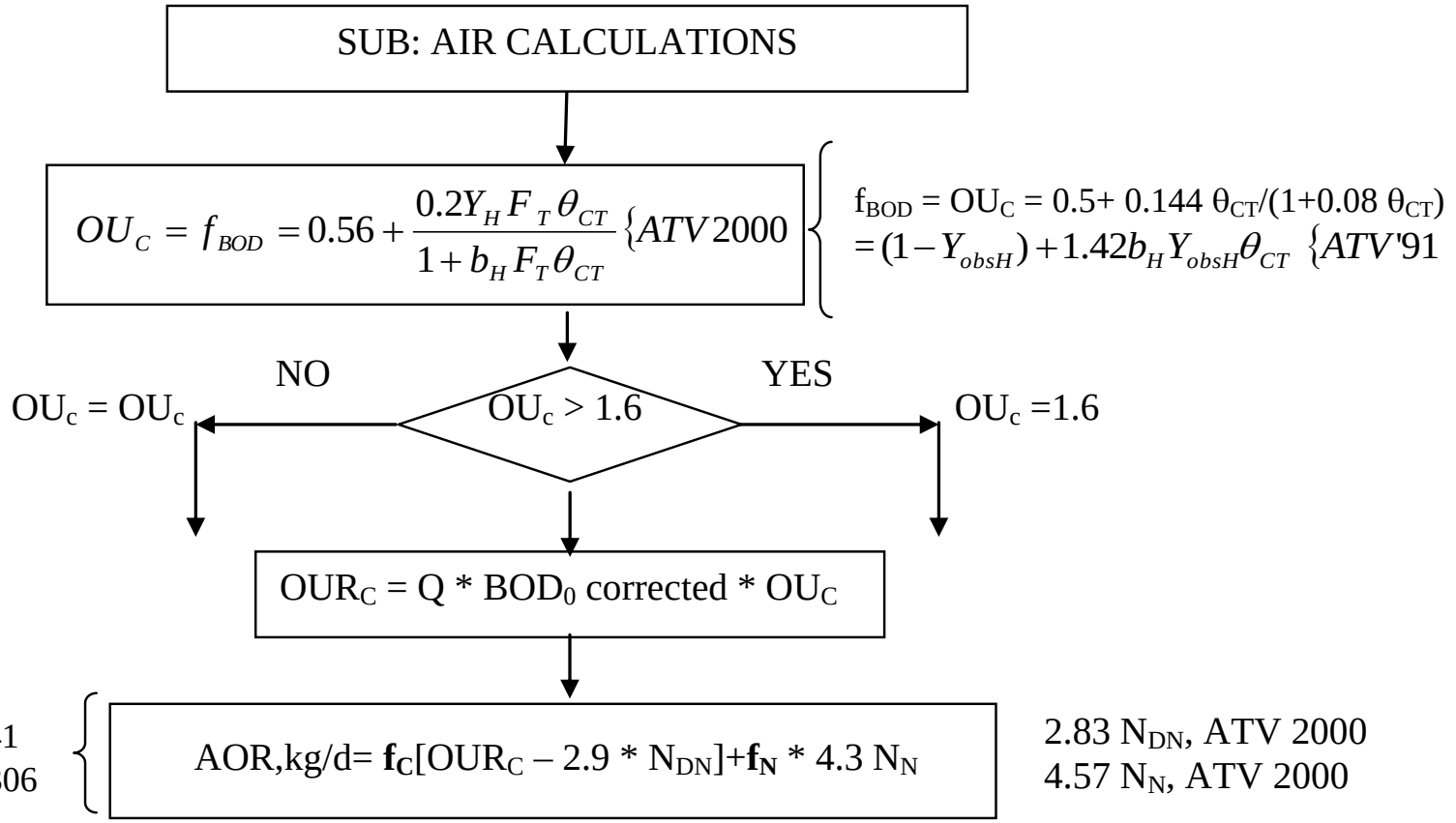
Hava Hesapları
Air Calculations

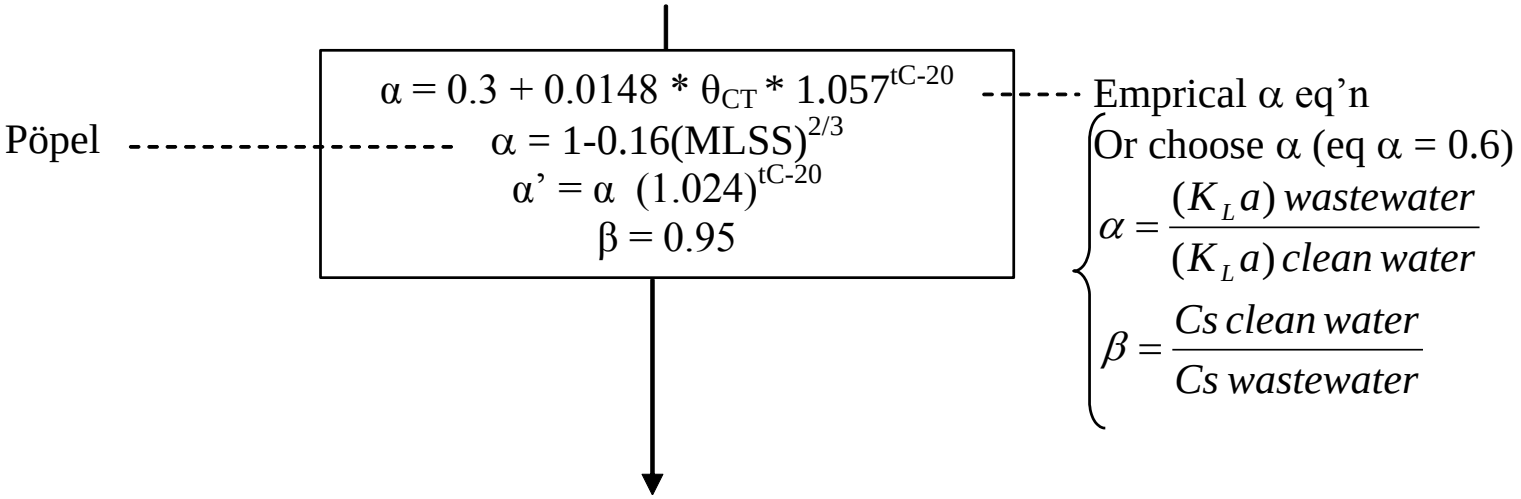
Ref: Metcalf & Eddy 3rd Edn, 2003

AOR= Actual Oxygen Requirement

AIR CALCULATIONS



Alpha & Beta


$\alpha = 0.3 + 0.0148 * \theta_{CT} * 1.057^{tC-20}$
Emprical α eq'n
Pöpel
$\alpha = 1\text{-}0.16(MLSS)^{2/3}$
$\alpha' = \alpha\ (1.024)^{tC-20}$
$\beta = 0.95$
Or choose α (eq α = 0.6)
$\alpha = \frac{(K_L a)\ wastewater}{(K_L a)\ clean\ water}$
$\beta = \frac{Cs\ clean\ water}{Cs\ wastewater}$

Eqn 5-55 M&E (2000)

Pd = Patm, Alt + Diff Depth

$$C_{S,T,Alt,av} = C_{S,T,Alt}\ \frac{1}{2}\left(\frac{P_d}{P_{atm,Alt}} + \frac{Ot}{21}\right)$$

Ot = (18-19) % O_2 in air leaving tank

$C_{S,20,sea}$=9.07 mg/L

$$CF = \frac{SOR}{AOR} = \frac{9.07}{F\alpha^{"}(\beta C_{S,T,Alt,av} - DO)}$$

DO = 2.0 mg/L

F = Fouling factor

SOR= AOR * CF

$$Air\ Density = P_a = \frac{PM}{RT} = \frac{\left(\frac{P_a}{P_b}\right)(1.01325x10^5\ N/m^2)(28.97kg/kgmole}{8314\frac{N-m}{kgmole.K}(273.15+T)}$$

$Q_{air,\ m3/d}$ = SOR / (1.201 kg/m^3 * 0.2318 kgO_2/kg air * %SOTE);

0.2786 kgO_2/m^3air

SOTE= Oxygen mass absorbed/Oxygen mass applied (Flyght %SOTE=30% for Membran diffusers)