R_e = Reynolds Number, dimensionless

K_s = Roughness coefficient in mm, as shown below in Table 7-3.

Flow Velocity (m/sec)	Colebrook-White, K_s (mm)
From 1.1 m/sec to 1.8 m/sec	0.15mm
Less than 1.1 m/sec	0.3mm

Table 7-3 –K_s Coefficients for velocity of flow

7.3.3. Localised Head Loses

Head losses also occur at valves, tees, bends, and other appurtenances within the piping system. These losses, called localised head losses or minor head losses, are calculated using the following equation:

$$h_L = K\frac{V^2}{2g} = K\frac{8\,Q^2}{g\,\pi^2 D^4}$$

Where:
h_L = Localised head losses of the pipe in m
K = Resistance coefficient, dimensionless, shown in Table 7-4 below
V = Velocity in the pipe in m/s
Q = flow through the pipe in m^3/s
g = gravity acceleration = 9,81 m/s^2
D = Inside diameter of the pipe in m

Type of Fitting	K Value
Entrances	
Standard bellmouth	0.1
Pipe flush with entrance	1
Pipe protruding	1.5
Sluice gated or square entrance	1.5
Bends 90°	
Medium radius (R/D = 2 or 3)	0.5
Medium radius (mitred)	0.8
Elbow or sharp angled	1.5
Bends 45°	
Medium radius (R/D = 2 or 3)	0.25
Medium radius (mitred)	0.4
Elbow or sharp angled	0.75
Tee 90°	
In line flow	0.4
Branch to line or reverse	1.5
Contraction - Sudden	
D2/D1 = 0.8	0.18
D2/D1 = 0.5	0.37
D2/D1 = 0.2	0.49
Contraction - Conical	
D2/D1 = 0.8	0.05
D2/D1 = 0.5	0.07