Discussion note

The output $\bar{p}_{\mathcal{K}}$ is given by *Equation: (1)*, which is a static equation

$$\bar{p}_{\mathcal{K}} = K^T \bar{H}_{\mathcal{T}}^{-T} f_{\mathcal{T}}(A_2^T q_{\mathcal{C}} + A_3 K \bar{d}_{\mathcal{K}} - A_3 D v_{\mathcal{D}} \sigma) - \underbrace{K^T \bar{H}_{\mathcal{T}}^{-T} \hat{H}_{\mathcal{T}}^T (\hat{p} + \hat{h}) - K^T \bar{h}}_{\text{Linear term}}. \tag{1}$$

We consider it as an input-output model where:

$K^T \bar{h} = \bar{h}_{\mathcal{K}}$ is the elevation of inlets ,
$\hat{p}$ is the elevation of WTs,

$$\Lambda \dot{\hat{p}} = -(\hat{H}_{\mathcal{C}} - \hat{H}_{\mathcal{T}} \bar{H}_{\mathcal{T}}^{-1} \bar{H}_{\mathcal{C}}) q_{\mathcal{C}} - \hat{H}_{\mathcal{T}} \bar{H}_{\mathcal{T}}^{-1} K \bar{d}_{\mathcal{K}} + \hat{H}_{\mathcal{T}} \bar{H}_{\mathcal{T}}^{-1} D v_{\mathcal{D}} \sigma. \tag{2}$$

$$f_{\mathcal{C}}(q_{\mathcal{C}}) - A_1(\hat{p} + \hat{h}) + A_2 f_{\mathcal{T}}(A_2^T q_{\mathcal{C}} + A_3 K \bar{d}_{\mathcal{K}} - A_3 D v_{\mathcal{D}} \sigma) = 0. \tag{3}$$

where

$A_1 = \hat{H}_{\mathcal{C}}^T - \bar{H}_{\mathcal{C}}^T \bar{H}_{\mathcal{T}}^{-T} \hat{H}_{\mathcal{T}}^T$,

$A_2 = -\bar{H}_{\mathcal{T}}^{-1} \bar{H}_{\mathcal{C}}$,

$A_3 = \bar{H}_{\mathcal{T}}^{-1}$.