A clever computation of the $\tilde{b}_{ii}$ by means of the so-called *Row-Sum-Trick*; consider the auxiliary problem

$$
\begin{align*}
-\Delta u(x) &= 0, \quad x \in \Omega, \\
u(x) &= 1, \quad x \in \Gamma = \partial \Omega.
\end{align*}
$$

This auxiliary problem has obviously the unique solution $u(x) \equiv 1$ ($\forall x \in \Omega$).

This immediately yields

$$
V(x) := \frac{\partial u}{\partial n}(x) = 0 \quad \forall x \in \Gamma
$$

(6) = special case of (1) PDE, $\Gamma_N = \emptyset$.

The Cauchy data of (6)

$$
u(x) = 1 \quad \text{and} \quad V(x) = 0
$$

will be exactly approximated by piecewise constant functions, i.e.,

$$
u = e := (1,1,\ldots,1)^T \quad \text{and} \quad V = \Theta
$$

must be solutions of (5)

$$
Bu = AV \quad \text{and} \quad Be = A\Theta = \Theta \quad (B = \frac{1}{2}I + \bar{B})
$$

that means

$$
\tilde{b}_{ii} = \frac{1}{2} + \tilde{b}_{ii} = -\sum_{j=1}^{n} \tilde{b}_{ij}, \quad i=1,2,\ldots,n
$$

NOW the generation of the matrices

$$
\bar{B} = \frac{1}{2}I + \bar{B} \quad \text{and} \quad A,
$$

and, therefore, of the system matrix $K = [A_0;\bar{B}_N]$ and the RHS $f = B_0u_0 - A_NV_N$ is completed. \(\blacksquare\)