ELEC 0041: Homework 2 - due on April 9 2024

A 150 kV, 50 Hz three-phase underground cable is to be installed in a residential area, 1 m below a sidewalk. The current to be carried by the cables is 900 A RMS. The diameter of each conductor, made of Aluminum, is 8 cm; the minimal distance between the conductors, center to center, is 16 cm.

You are asked to:

- Calculate the level of magnetic flux density at 1.5 m above the sidewalk, for both a flat and a trefoil arrangement of the conductors.

- Propose a practical shielding system to attenuate the maximum field level to 0.4 μT at 1.5 m above the sidewalk.

- Compute the Joule losses in the conductors and in the shield.

- *Bonus: compute the steady-state temperature of the conductors and the shield if the sidewalk and the soil far away from the conductors is assumed to be at a constant temperature of 10 degrees Celsius.*

Write a 4 page report where you present and comment your results.

Send your report by email to `cgeuzaine@uliege` in PDF format together with your model files, bundled in a single `.zip` file named `hw2_FirstName_LastName.zip`.