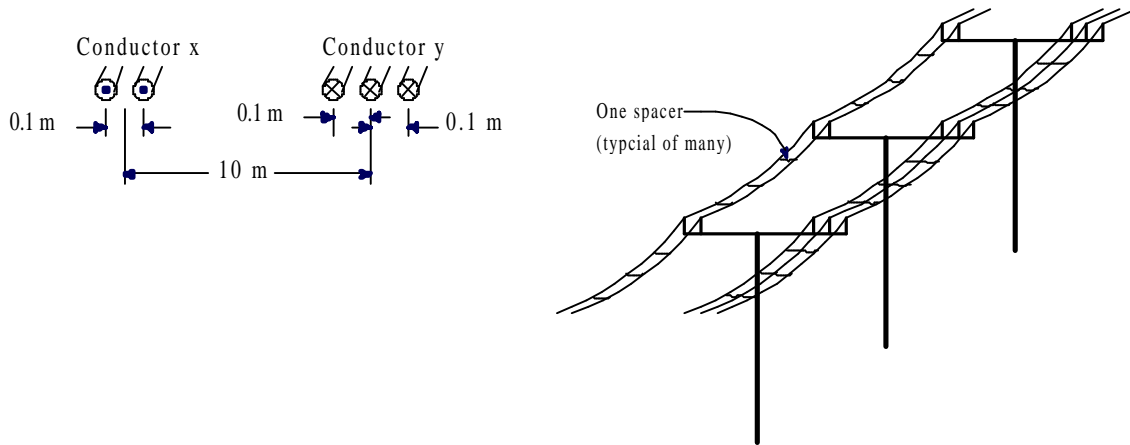


- 4-17 A single-phase transmission line is composed of conductors labeled x and y . Conductor x carries current in one direction using two bundled wires, as illustrated below. Conductor y carries current in the other direction and has three bundled wires. Each wire in a bundle is separated from the other wires in the bundle by 0.10 m long metal (conductive) spacers that are fastened to the wires about every 20 m along the length of the transmission line. (Spacers are illustrated on the right below.) Each wire in a bundle has a radius of 0.005 m. Find the total inductance of the single-phase transmission line in H/m. Include the surface effect (a 2% increase) and the effect of stranding (another 2% increase) in your answer.



- 4-18 A three-phase transmission line has three equilaterally (triangularly) spaced conductors of *ACSR Dove* conductors. The conductors are spaced 15 feet from each other. Determine the per-phase reactance (in Ω/km) for a 60 Hz system. Data for this cable can be found on the Web, for example from Southwire Company. Do a search for “Southwire ACSR Dove” (without the quotes) for example.

Hint: the “wire size” or “wire gauge” does not imply the literal outer diameter of the wire. It is a nominal specification. The manufacturer specifies the actual outer diameter of the complete cable, which is what you need for this problem.