

Determine the following (showing all stages of calculation and applicable Regulation numbers and table numbers)

Part One.

- Maximum demand for the new building both before and after applying diversity (use the business diversity allowances).
- Balance the complete load over a 3 phase supply (without the diversity allowances).
- Select a suitable sized main switch to be installed in the main switchroom.

Part Two.

- The size of the required sub-main cable, including volt drop.
- The minimum size of armouring required to provide an adequate earthing arrangement to conform with the requirements of BS 7671.
- The maximum and actual values of Z_s for the sub-main cable.
- The expected value of prospective earth fault current at the termination of the sub-main cable in the new building.

Part Three.

- The volt drop on one of the 3 phase final circuits. The circuit is 38 metres long and wired in 2.5mm^2 SWA 90°C insulated conductors.
- The maximum and actual volt drop on one of the 3kW convector heater circuits if wired in 2.5mm^2 conductors with a total circuit length of 28 metres.
- The maximum and actual values of Z_s for the 6kW cooker circuit if wired in 6.0mm^2 live conductors and 4.0mm^2 cpc with a total circuit length of 15 metres.

Part Four.

- Suggest suitable ratings of all the final circuit protective devices.
- State the maximum values of Z_s for all of the final circuits.
- For each final circuit state the maximum disconnection time and the value of fault current to meet this time value.