Guidelines to the 1-2 practices

Heat load calculation with using generalized characteristics

Construction of Rossander's graph

1. According to your individual variants calculate heat flows for given types of consumers for:
    - Heating (Q^{p}_{hv});
    - Hot water supply during heating season (Q^{av}_{HWS}), maximum heat flow for hot water supply (Q^{max}_{HWS}), heat flow for hot water supply during summer period ($Q^{av}_{HWS\ summer}$);
    - Ventilation (Q^{p}_{vv}).

All these heat flows are calculated according to formulas from the 1st lecture and example (see Power Supply_Practice 1. Ppt) and correspond to the predicted temperatures for heating and ventilation (except hot water supply load).

2. Calculate total heat load for individual types of consumers (Q^{p}_{total} for residential and public buildings).
3. Calculate total heat loads for different type of heat loads separately for the whole micro district (Q^{p}_{hv}, Q^{av}_{HWS}, Q^{max}_{HWS}, $Q^{av}_{HWS\ summer}$, Q^{p}_{vv} for the whole micro district).
4. Build Rossander's graph:
    - The left top quadrant – dependence of heat loads for heating, ventilation and hot water supply on outside temperature.

Curve of heating load: Use chosen scale for X and Y-axes put the dot corresponding to the predicted values of heat flow (Q^{p}_{hv}) for micro district which will correspond to the predicted temperature for heating on X-axis. Recalculate value of heat flow for heating according to +8°C outside air temperature. Put this dot to the graph, connect these dots.

Curve of ventilation load: Use chosen scale for X and Y-axes put the dot corresponding to the predicted values of heat flow (Q^{p}_{vv}) for micro district which will correspond to the predicted temperature for ventilation on X-axis. Recalculate value of heat flow for ventilation according to +8°C outside air temperature. Put this dot to the graph, connect these dots. Draw the straight horizontal line from the predicted temperature for ventilation up to predicted temperature for heating of outside air.

Curve of hot water supply (HWS) load: Use chosen scale for X and Y-axes draw the straight horizontal line of HWS load for heating season (Q^{av}_{HWS}).

- The left bottom quadrant –curve of continuance of standing outside temperatures which equal to given temperature or lower during heating season

Using table 5 (Average long-term repeatability of outdoor temperatures) in Power Supply_Practice 1. ppt construct the line of continuance of standing outside temperatures starting from the predicted temperature for heating and summing up to the previous values of hours (given in table) and present values.

- The right bottom quadrant a straight line is drawn at an angle of 45 degrees, which is used to transfer the values of n-scale from left bottom to right top quadrant.
- The right top quadrant is the graph of duration of seasonal heat load. It is drawn for different outside temperatures from the points of intersection of the dashed lines that determine the heat load and the duration of the standing of loads equal to or greater than given.