

Design and Construction Process of Ventilation in Educational Buildings

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ABSTRACT



The purpose of this study was to create and apply in practice a ventilation implementation process in which the goals of air-conditioning construction are clearly specified and the implementation of the goals is confirmed on the basis of calculations made in the planning phase and inspections and measurements made in the implementation phase. The implementation process model was to be independent of the type of contract used. Special attention was paid to the interfaces between the various phases of the process. The implementation process model was developed and tested in 11 new or repair construction sites in educational buildings.

The requests for bids on the planning of the sites under study were compared to the tasks listed in the building technology design publication, TATE 95, and its supplement. The air-conditioning plans of the studied sites were examined to determine whether the goal of a good indoor climate could be confirmed with the help of the calculations, how well the technical specifications of the equipment were derived from the calculations, and how well they were presented in the plans.

Implementation of the studied sites during the contracting phase was compared to the plans as far as equipment selection and installation was concerned. The quality of the installation work was compared to the regulations and instructions contained in the Finnish Building Regulations, type approval decisions, and the general quality requirements of HVAC construction. Measurements were made at the time the sites were taken into use to determine how well the final result compared with the goals that were set.

The developers, planners and contractors of the sites under study were interviewed. The purpose of the interviews was to determine the opinion of the various parties involved with each studied site regarding the success of goal-oriented implementation and the significance of the effects of the various partial factors.

Commitment of the various parties involved in a construction project to an indoor climate goal is still such a new concept in current construction that confirmation of the goal in the sites under study was incomplete in both the planning and contracting phases. Nevertheless, the developers of the studied sites reckoned that the goals were achieved quite well or at least satisfactorily. These evaluations were supported by the results of measurements of the indoor climate.

Planning applications facilitate calculating needed to confirm attainment of the goal. In order to be able to evaluate the adequacy and accuracy of the calculations, the client should require them to be presented and documented as planning documents. This would improve the quality of the plans and the compatibility of the final results with the goals.

In current construction practice, a goal-oriented implementation process is hindered by the dividing up of responsibility for implementation of the indoor climate goal among too many parties. Each party should commit themselves to indicating the implementation of their share by means of either calculations or measurements. Furthermore, control of the entity in this type of system requires a development organization with sufficient professional supervisory resources.