Name: MultipleZoneAndDisciplines

Identifier: 5

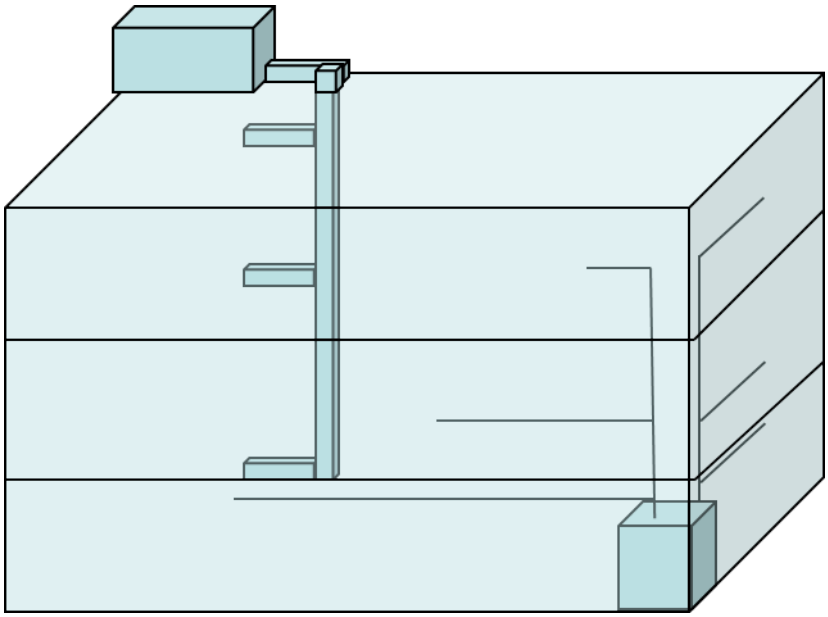
Short identification:
Multiple thermal zones with different HVAC disciplines to supply the different conditions.
The HVAC-systems are supposed to heat, cool giving air supply

Objective:
This sophisticated use case focuses on the HVAC system as well as the use of multiple zones compared to the simpler one-zone use cases. This use case is used to investigate the needed data structure of a Modelica model compared to an ifc-file. Based in these models we establish the requirements for the dataflow from BIM to Modelica (depending on the information needed for the components of the specific library). Hence we highlight the difference between the different models and the gap of information that is needed to simulate.

Technical Description of the different thermal zones:
- Multy-storey-building with different zones
- Three different zones
- Adiabatic (no heat transfer through) internal walls and slabs. Heat transfer only through the outer wall and window
- Inner Loads: Occupancy, Plug loads, Lighting (different for each zone)
- Weather-data: TRY_dataset for Germany, zone 5 (Aachen)

Technical description HVAC-system:
- Heating loss: 1300 W (Θ_i= 21°C, Θ_e= -12°C)
- Heating system: Boiler-gas-system with radiator on the demand-side
- Domestic-hot-water-system (same as use case 1.2)
- Ventilation-system: AHU for cooling (same as use case 4.2)

Graphical description Thermal Zone:



HVAC components needed in the specific BIM/Modelica library to build this use case:

- Air duct
- Supply air damper
- Return air damper
- Silencer
- Pressure controlled fan for supply air (radial/axial)
- Pressure controlled fan for return air (radial/axial)
- Air filter (Supply and Return)
- Electric device for heating or cooling (Peltier Element)

- Gas-/ Oil-boiler
- Expansion Vessel
- Variable Pumps
- Valves
- Radiator
- Pipes for supply and return
- Hot water tank
- Additional expansion vessel on the hot water side
- Tap for domestic hot water

Some components listed above are not necessary to run a simulation, but are needed to represent a realistic use case.