Heating, Ventilating, and Air-Conditioning (HVAC) Plan Submittal Reminders from the Safety and Buildings Division (4/016/2009)

Depending upon the nature of the project and the scope of the work - new building versus alterations- the following code aspects are items Safety and Buildings Division plan reviewers focus on during review of an HVAC submission:

- Heat loss for habitable spaces
- Outside air demands for and supplies to habitable spaces (natural ventilation and/ or mechanical ventilation.
- Type of equipment, their listing, efficiencies, capacities relative to heating, cooling and/or ventilation

Separate HVAC submittal?

Wisconsin's Commercial Building Code, Comm 60-66, allows for separate submission of HVAC plans from the building plans. Such submission may involve a different designer than that of the building plan submission. In all cases, it is extremely important that the HVAC designer coordinate their plan submission with the building plans. Particular care for coordination should be paid to the interior layout of the spaces and the insulation values of the various components comprising the building thermal envelop. If possible, the HVAC plan approval application form should include the transaction I.D. number of the building plans under the heading: "Previous Related Transaction I.D."

This is a set of reminders, not a required form.

Code language in Comm 61, Commercial Building Code, says that construction documents and calculations submitted "to the department or its authorized representative for review shall be of sufficient clarity, character and detail to show how the proposed design will conform to this code."

The Safety and Buildings Division offers the following submittal reminders to assist in assuring complete plan submittals. This is not a checklist that is mandatory; it does not need to be submitted. The list is not all inclusive. It is meant to highlight some items that S&B plan reviewers look for and to help reduce delays due to incomplete or insufficient submittals. It is helpful to the plan reviewers for designers to emphasize or point out where calculations are on the plans.

A separate HVAC submittal should include the following information:

A. Layout Plans

1. Interior layout, room names and uses
2. Location, volume, and/or rates in CFM of exhaust, make-up air, outdoor air and combustion air
3. Location of equipment and appliances, fire, smoke and ceiling radiation dampers, fire wraps, kitchen hood exhaust duct, grease duct enclosures, suppression systems, controls, monitors, supply inlets, exhaust outlets, etc
4. HVAC distribution ductwork, sizing, location,
   a. Metal duct gauge, geometry (round, square, rectangular), and length
   b. Flexible duct diameter, specification
   c. Flexible connector diameter, length
   d. Underground duct construction, materials, vapor barriers, insulation (R-values), clearances
   e. Plenum construction
5. Guardrail location and dimensions for rooftop equipment

B. Details

1. Insulation for duct or pipe - type, R-value labeling
2. Pipe size, type, hydronic or gas
3. Kitchen hood information
4. Air transfer to corridors if as allowed by code
5. Clothes dryer exhaust duct distribution, access doors
6. Metal duct gauge, geometry, means of fastening, maximum length
7. Duct sealing methods and duct wrap specifications
8. Flues and chimneys
9. Platform and clearance locations for rooftop equipment

C. Equipment Information

1. Equipment schedules or similar information which indicate equipment type, capacities, efficiencies, associated air rates in CFM
2. Listing information that matches up with standards (ASTM / UL / NFPA / ANSI, etc.)
3. Operation, controls and sequencing
4. Economizer (if required and part of installation)
5. Make-up air
6. Duct smoke detection system (if required) showing duct smoke detector locations, model defined, installation defined, sequence defined, control panel location and model

D. Calculations

1. Heat loss calculations
2. Heat gain calculations
3. Transmission losses plus greater of infiltration or ventilationlosses for sizing heating appliances
4. Volume of exhaust and outdoor air intakeub CFM
5. Combustion air for equipment
6. Wall and Roof Insulation R-Values, Door and Fenestration U-Factors.

E. Ventilation

1. Mechanical ventilation rates in CFM that correspond to calc's
2. Natural ventilation provided (percent of openables)

F. Minimum Clearances

1. Exhaust outlets and outside air intakes to property lines
2. Distance between intake and exhaust ventilation openings
3. Overhead clearances (suspended appliance)
4. Location of intakes above ground/roof

H. Miscellaneous Reminders

1. Boiler installations require a separate notification - see Boiler Code Comm 41-42.
2. Refrigeration installations require a separate notification - see Refrigeration Code Comm 45.