

AIR CONDITIONING AND VENTILATION OF SMOKING ROOMS

by

Darcee A. McAninley, P.E., C.I.A.Q.P.

Wojcieszak & Associates, Inc., P.O. Box 2528, Stuart, Florida 34995

E-Mail: darcee@dwojo.com

(772) 286-8696

Introduction

Smoking rooms inside buildings create a challenge for odor control. Containing the smoke to minimize its migration into adjacent rooms requires filtration, exhaust, and ventilation.

Pathways for Smoke Migration

Smoke can travel through the air to adjacent rooms with relative ease. Common pathways include imperfections in the building construction, improper sealing of piping penetrations in the walls, floor and ceiling, opening and closing of the door, wind pressure on the building, etc. The goal is to first design and construct smoking rooms in a manner to minimize smoke migration.

Isolate the Smoking Room

Smoking rooms should be separate from other rooms. They must have doors that partition the room off. In addition, the air conditioning system should serve only that room. If not, smoke can easily be distributed to other areas.

Exhaust System

The next step in smoke containment is to effectively exhaust the smoke as it is produced. This is best accomplished by locating exhaust grilles in the ceiling as close to the smoking area as possible. The amount of exhaust air should be enough to negatively pressurize the room by about 7 Pascals. To adjust the exhaust fan so that this pressurization can occur, install a speed controller on the fan.

Filtration

Activated carbon filters are very good at removing the

odor produced by tobacco smoke. A 25 pound or greater filter is most effective. The two-inch thick pleated filters would only do the job if not much smoking was anticipated.

In addition to the odor, smoke has particles that float in the air. It is also important to remove these particles. This can be accomplished by installing a 65% ASHRAE filter on the air handler supply side. The fan motor in the air handler will have to be increased to overcome the static pressure drop across both filters. Filter replacement and maintenance is crucial.

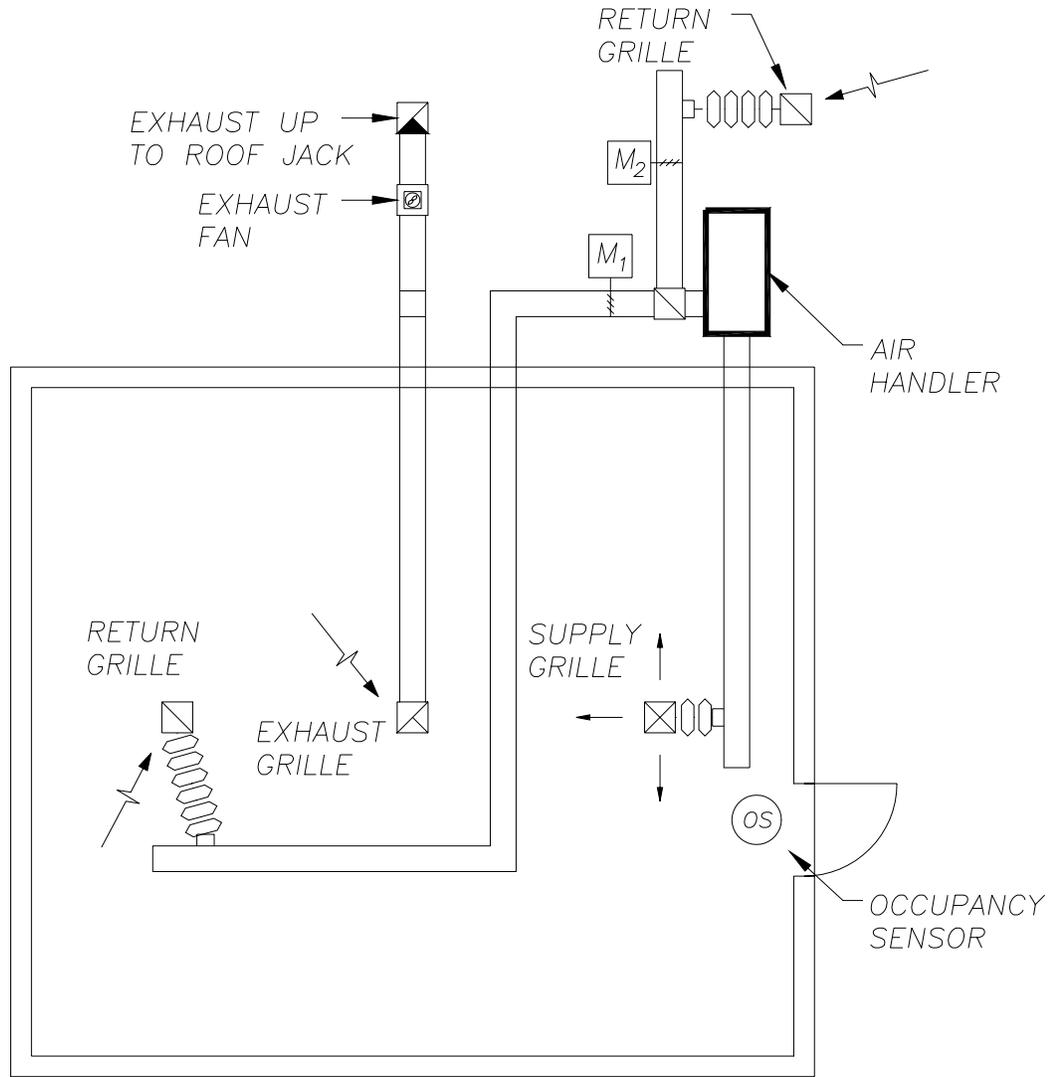
Ductwork

Ductwork for the supply, return, and exhaust air should be sheet metal. The supply and return duct should be externally wrapped with insulation. It may be necessary to clean the ductwork at periodic intervals.

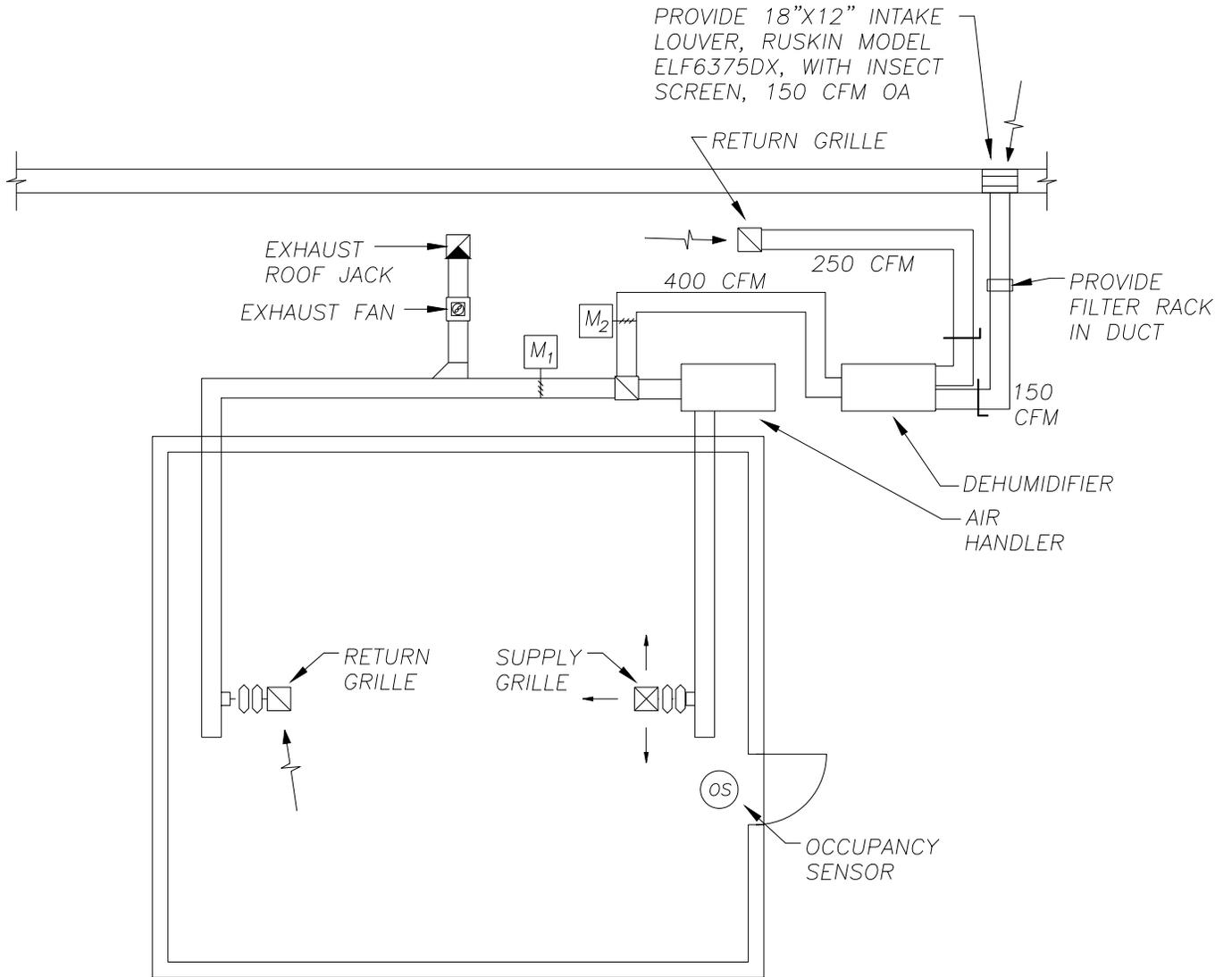
Make-up Air

Make up air may be necessary. If the exhaust system takes more than ten hours to drain all the air in the building, then all air in the smoking room should be exhausted. The return air should be taken from an adjacent space while the exhaust system is in operation by way of motorized dampers. See the attached sketch, ***Smoking Room – Exhaust All.***

Make-up air should be provided if the exhaust system drains all the air in the building in less than ten hours. In this case, only a portion of the air should be exhausted, and the rest be recirculated. Make-up air should always be pretreated to minimize the amount of moisture being brought into the building. See the attached sketch, ***Smoking Room – Partial Recirculation.***



SMOKING ROOM-EXHUAST ALL



SMOKING ROOM—PARTIAL RECIRCULATION