

Lecture -2-

2.1 Duct Layout (Duct Configurations)

مخطط مجاري الهواء

Conditioned air from the air handling equipment is supplied to different spaces through the duct system. The layout of the system depends upon the **type of the building**, **its construction** and **orientation**. Four such layout patterns are described below :

(A) The Perimeter System

النظام المحيطي

This system is commonly used for **residential buildings**. The air handling unit is placed at the basement and nearly located in the centre of the building. The ducts run through the basement and the floor. **The supply outlet grilles are placed close to the ceiling level**. The return grilles are then located on the bottom side. The overall duct lay out can be arranged in a loop system, as shown fig.1 or in a Radial Perimeter system, as shown in fig. 2.

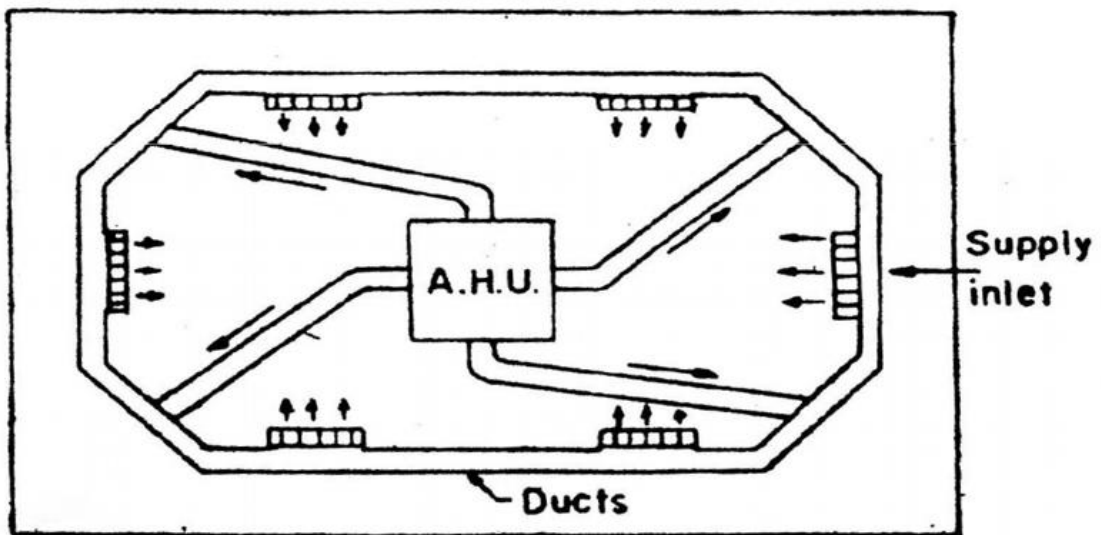


Fig. 1: The Perimeter System in a Loop

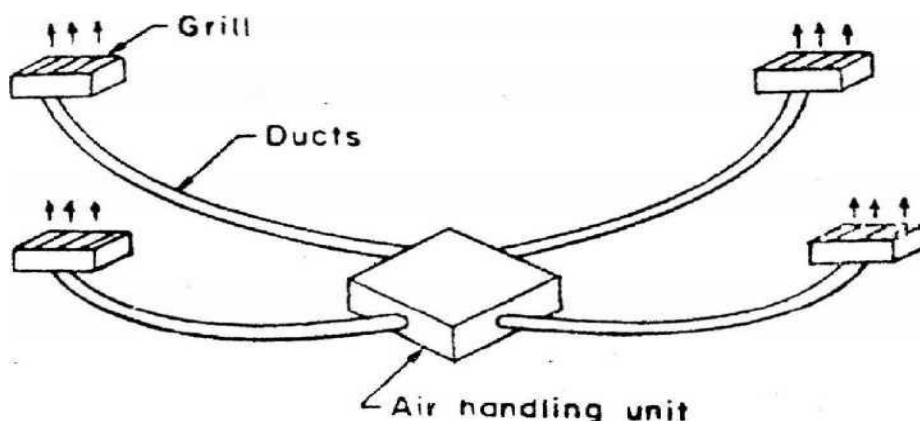


Fig. 2: Radial Perimeter System

(B) The Extended Plenum System

نظام الحجرة الممتد

The main duct runs in the center of the building in the form of extended plenum and the branch ducts are then connected to this extended plenum. A common layout of extended plenum system is shown in fig. 3. The advantage of this system is that the supply grilles can be located at any required place as per design of the building. The air handling unit can be placed at any convenient place. The lay out can be used either for residential or for commercial buildings.

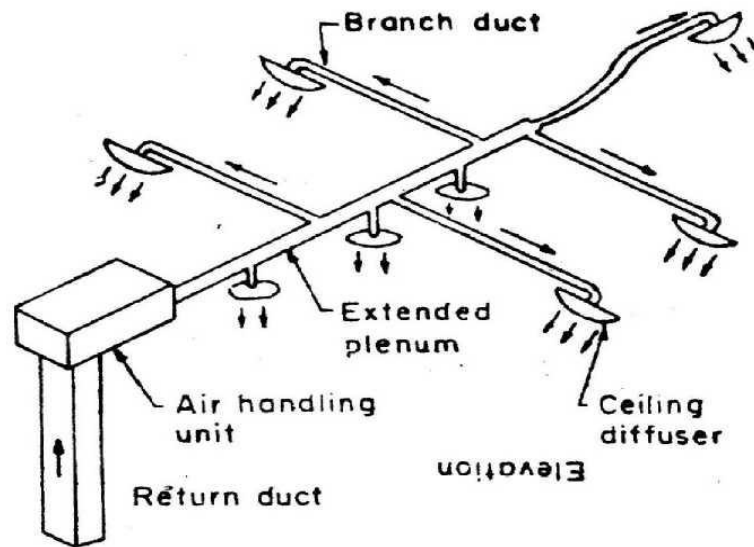


Fig. 3: Extended Plenum System

(C) The Parallel Duct System

النظام المجري المتوازي

Fig.4 shows a common layout of such a system. The parallel duct air distribution is most suitable for large commercial buildings. The duct runs parallel to the building and the return air is taken from the central corridor. The air handling unit is placed on one side of the building.

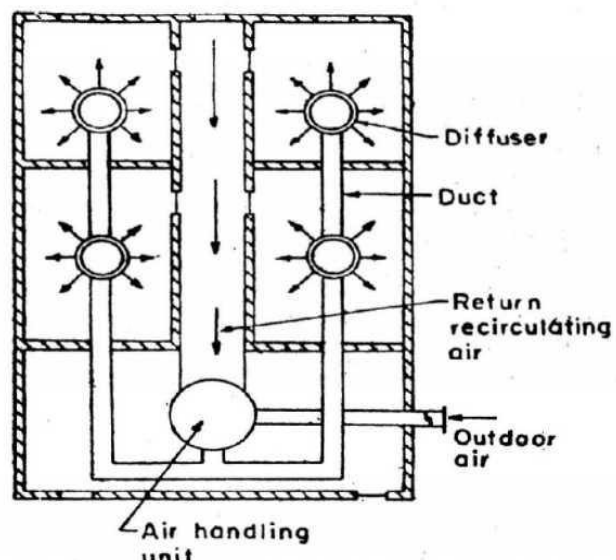
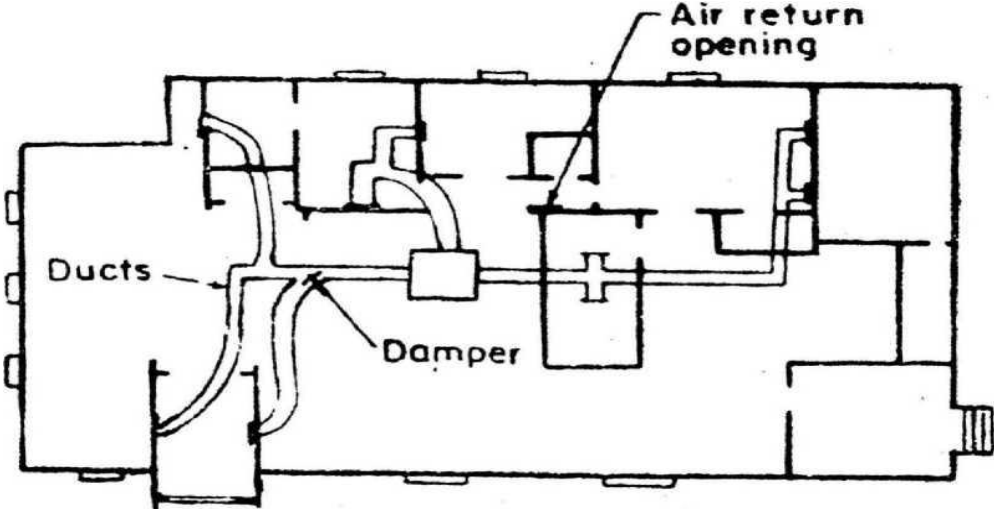


Fig. 4: Parallel duct system

(D) The Trunk Duct System

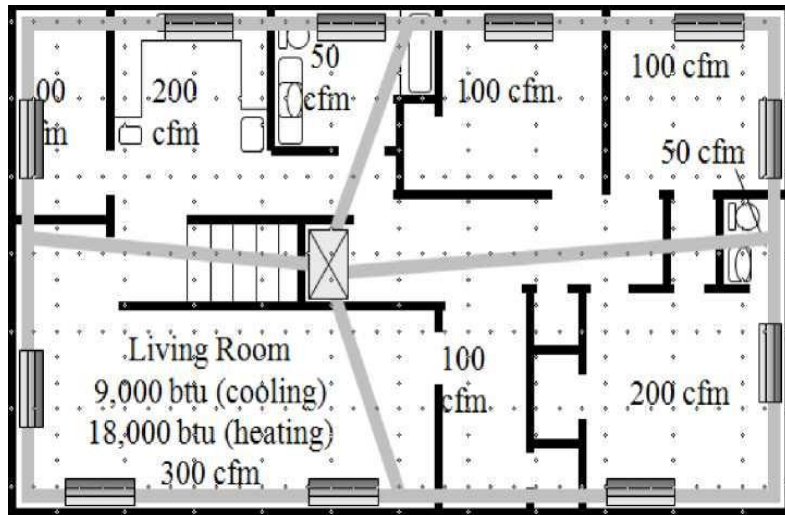
النظام المتفرع

Fig. 2.5 shows such a lay out which is most commonly used for residential buildings.

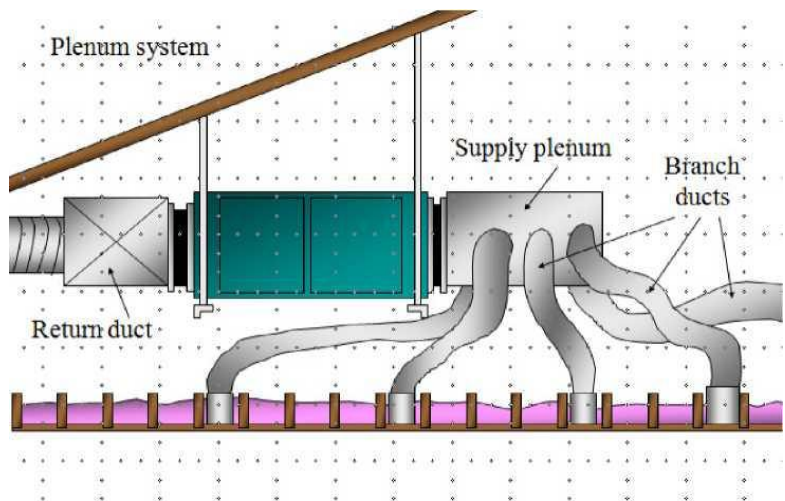


2.5: Frunk Duct System

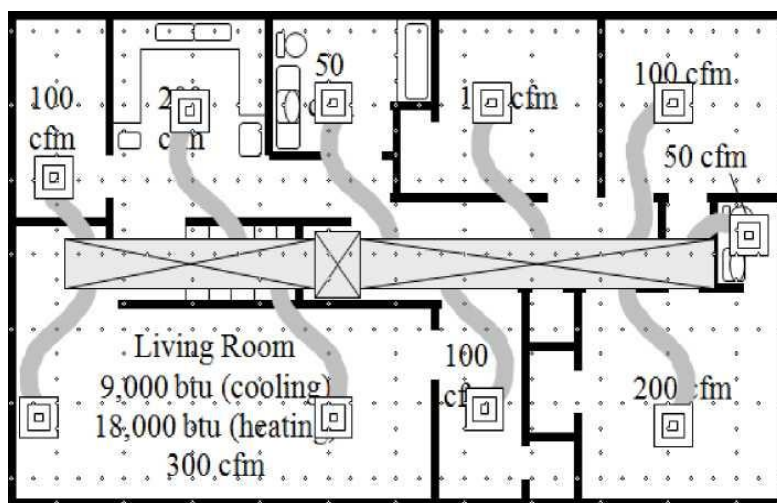
Practical Examples of Duct Layout



The perimeter system



Radial perimeter system



The extended plenum system