

8. Chilled beams and chilled false ceiling

Chilled beams can be passive or active.

Passive chilled beams have a chilled surface formed into a linear finned coil, which is then surrounded by a pressed steel casing and suspended from the ceiling. Warm air rises to the ceiling and enters the top of the beam, where it is cooled by contact with the cold coil. The cool air descends into the room through outlet slots on the underside of the beam. Limitation with passive chilled ceiling is that, it takes considerable time to achieve the comfort temperature and still cools the space even after the closing hours.



8.1

Active chilled beams incorporate tempered ventilation air supplied through ducting in the beam itself. Tempered air leaves the supply duct through slots or nozzles with sufficient velocity that it induces warm air in the room into the beam and through the cooling coil reducing its temperature. The supply and chilled air mix and enter the room via outlet slots on the underside of the beam. Passive system has capacity to cool 100 w/m² and it is possible to integrate lighting system.

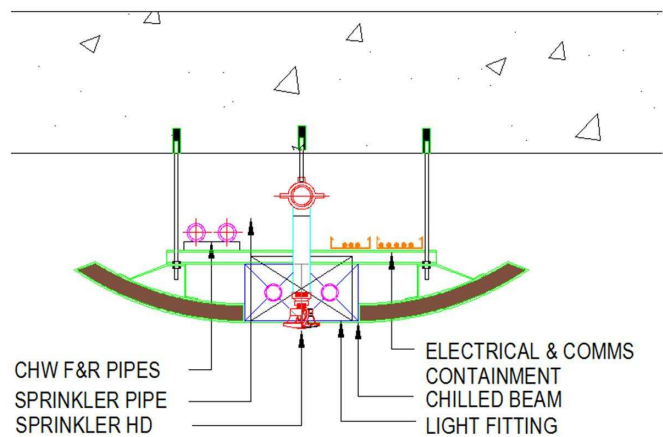


8.2

Both chilled beams and chilled false ceiling can be used for office space. Lighting system can be integrated with the chilled beams and other services such as electrical cables, sprinklers and water supply pipes can be hidden. Chilled metal false ceiling can replace conventional false ceiling (Gypsum or grid false ceiling) without compromising the conventional false ceiling abilities and still be able to cool the space. Both the chilled beams and chilled false ceiling has to be integrated with fresh air supply system.

Advantages of chilled ceilings and beams

- Chilled ceilings and beams are a low maintenance way of cooling a room. There are no internal fans or filters that could break down or need cleaning – all maintenance is at the central plant area and so access is not regularly required into the space served.
- They are also an energy efficient method of cooling, mainly due to the operating parameters of the system.
 - The low fan speed used to deliver air to the outlet diffusers has a low energy requirement (energy used by a fan is proportional to the cube of the fan speed).
 - They operate at relatively high chilled water flow temperature meaning the chiller has to do less work than for, say, a fan coil system.
 - Higher operating temperatures allow the use of free cooling.



8.3

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