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Increasing air exchange rates in offices poses some serious challenges

By Ben Cousins | 29 March 2021



There are implications for the size of air handling units and ductwork, but also developers must factor in higher energy consumption and costs, says Ben Cousins

There are few who would disagree that air quality in workspaces is going to be a big deal in the coming years, and covid-19 has raised public awareness about airborne infections and pollutants. Providing cleaner air is vital to the health and wellbeing of occupants and our practice has been working with clients and specialist consultants prior to the pandemic to tackle just these issues.



So, the [new recommendations made as part of the proposed Future Buildings Standard from the MHCLG](#) that we need to improve standards across the board are very welcome but the impact on new and existing buildings is greater than a lot of people realise. How will the new standards affect the shape and cost of new office projects, and what does this mean for other systems and processes?

Current regulations suggest a minimum air exchange rate of 10 l/s/p and the new report from the MHCLG recommends an increase of 50%. This

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takes us to 15 l/s/p which is higher than the requirements from the BCO, BS ISO 17772 standard, building regulations, and ASHRAE. This is going to have significant implications for the size and weight of air handling units, as well as acoustics and energy consumption, all of which have to be taken into account by office providers when assessing the viability of their projects.

Unfortunately, we may start to see a trade-off between wellness and environmental sustainability

Larger air handling units will be required to pump air around buildings, which means additional mass is required or a loss of net internal area as space is taken from lettable areas and given over to plant. Installing greater roof plant has obvious architectural and planning implications, which puts retrofit projects at a particular disadvantage, as many will not have adequate roof space and may need additional structural alterations to support the increased weight. Careful considerations are required at an early stage.

A significant increase in the size and quantity of ductwork will also be needed and if careful coordination is not undertaken during the design phase then layouts may be constrained and have reduced flexibility. Higher floor-to-floor heights will be required and, once again, this has a greater impact on retrofit projects, as there often is not an allowance for enough ductwork to run under existing structure. Furthermore, without an increase in ductwork size, more air leads to more pressure and noise as air transfers across large spaces. Steps will need to be taken to mitigate the need for acoustic treatments.

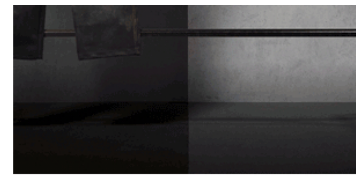
> **Explainer: the proposed Future Buildings Standard in detail**

Cellular office accommodation and smaller private offices more suited to SMEs and young businesses are more difficult to serve with quality air, because each space requires its own supply and extract. With the need for filtration, acoustic attenuation, and the inability to implement a cascade approach, this becomes costlier.

Unfortunately, we may start to see a trade-off between wellness and environmental sustainability. Larger plant, differing strategies and higher loads will result in a higher energy usage. Furthermore, the requirement to filter air and provide such high air change rates, makes natural and passive ventilation strategies difficult to achieve.

MHCLG says larger equipment running at lower capacity will reduce the energy consumption. However, this is in direct contrast to what some local authorities currently believe

The MHCLG has suggested that larger equipment running at lower capacity will reduce the energy consumption required. However, this is in direct contrast to what some local authorities currently believe. If projects are to get through planning then a clear decision must be made and the information properly disseminated before workspace schemes get tied up in endless red tape.



The WELL Standard – which we are using on a number of new projects – prioritises filtration over air exchange, working within the current ventilation standards but filtering particulates before the air is recirculated. This demonstrates a clear difference of opinion from the government advice and this approach could be as effective without the huge ramifications that we might expect from the increased ventilation rate standards.

Another potential solution could be provided through building sensors. Careful monitoring of air quality provides the data we need to take action in a more targeted manner. The equipment that would be installed is getting better all the time and can be integrated into existing building management systems easily. This requires nowhere near the same investment as larger air handling units and increased ductwork.

Clearly techniques to improve air quality are harder to implement for retrofit projects but not impossible, they just require careful planning from the outset. Some of the approaches described above are more suited for new-build projects where the ventilation strategy can be designed in from the ground up.

Developers need to be aware of the costs involved when they are calculating the profitability of their schemes. On the plus side, high-quality working environments will do better in the current market and it's vital that we stay ahead of new regulations. The added pressures brought about by the pandemic mean that we can no longer afford to ignore the demand for workspaces that put health and wellbeing at the centre of their business strategy.


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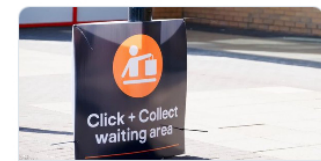
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