

ELEVATOR SHAFT NATURAL VENTILATION

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Since the publication of BSEN81-1 and 2 in 1998, there has been confusion regarding the provision of natural ventilation to elevator shafts. The Building Regulations for England and Wales no longer call for dedicated shaft ventilation to be provided. In discussions with the people responsible for the technical accuracy of Building Regulations, they confirmed it was deliberately removed, because as far as they were concerned, it served no useful purpose. The 1% cross sectional area of the lift shaft was not deemed sufficient for smoke dilution or removal. The same question was put to the Fire Service and they also stated that the resultant area is not sufficient for the same purpose.

BS5655-6 1990 clause 3.3.3 stated that *“it is necessary that the well be suitably ventilated and not used to provide ventilation of rooms other than those for the service of the lifts. Provision should be made, at the top of the shaft, for ventilation openings, with a minimum area of 1% of the horizontal cross sectional of the well to the outside, either directly or via the machine or pulley rooms. When the well is ventilated via the machine room or pulley rooms, through trunking should be used”*. *“Note The London Building Acts or other local regulations may require larger vent areas under certain circumstances.”*

BS5655-6 was updated in 2002 and superseded the 1990 version, which was subsequently withdrawn. Clause 5.3.3 of the 2002 publication stated *“Note: Attention is drawn to the fact that building or fire regulations might require the well to be ventilated”*. *“Special arrangements can be needed where the ventilation provided naturally, as the result of door operations and through gaps around doors, access doors, access traps/doors and other openings into the well, such as ductwork, is insufficient. The well should not be used to provide ventilation of rooms other than those for the service of the lifts. When the well is ventilated via the machine room or pulley rooms, through trunking to the outside should be used. The vents should be louvered or otherwise protected to prevent rain, snow, birds, etc. from entering the well. In order to reduce ‘buffeting’ for lifts with a speed exceeding 2.50m/s, pressure release vents might be needed. A single lift can require a minimum of 0.3m² with an additional vent area of 0.1m² for each additional lift sharing a common well”*.

BSEN81-1 1998 clause 5.2.3 states that *“the well shall be suitably ventilated. It shall not be used to provide ventilation of rooms other than those belonging to the lift. NOTE In the absence of relevant regulations it is recommended that ventilation openings at the top of the well, with a minimum area of 1% of the horizontal section of the well, are provided”*. The relevant regulations referred to are the Building Regulations for England and Wales, which as stated previously, deliberately removed elevator shaft ventilation as it served no useful purpose.

Building Regulations Section L does refer to providing ventilation in shafts where dangerous gases or substances could be released, that could build up and create a hazard. It may have been thought that as “other” services were sometimes placed in lift shafts, the shaft should be ventilated. This is now prohibited by BSEN81 and should not arise in future. Section L also requires that buildings are airtight and the provision of a ventilation opening at the head of the shaft will cause conditioned air to be drawn from the building, through the shafts and wasted to atmosphere. With buildings where shaft ventilation has been provided, the vent opening or all the entrances have to be sealed up to test that the building is airtight. Modern sustainable design requires that buildings are arranged this way, so energy used to condition the air and resultant space temperature is not wasted or compromised.

BS5588-5 2004 and BSEN81-72 2003 make no reference whatsoever to the provision of elevator shaft ventilation.

It can be seen that the 1990 edition of BS5655-6 had a clear requirement for shaft ventilation to be provided, with a caveat that larger vents may be required by London Building Acts or other regulations. The 2002 edition of BS5655-6 changed the perspective to ventilation “might” be required by Building Regulations. BS5588-5 2004 and BSEN81-72 2003 have no references to shaft ventilation, whilst BSEN81-1 1998, does refer to suitable ventilation being required but does not define what ‘suitable’ is, other than in a note. The BSI has confirmed that notes within BSEN81-1 are informative and not normative. Notified Body approval and subsequent granting of dispensation would not be required, as no deviation from BSEN81-1 is made or left out.

The particular note referred to with clause 5.2.3 of BSEN81-1, was added because when the document was in draft, the requirements of Building Regulations



whilst known about, were not properly defined. The precise origin of the 1% requirement could not be determined and the general consensus is that it most likely emanated from the London Building Act 1939. In London during the early 20th century, shafts were used within many buildings to route mechanical & electrical systems, as well as gas supply pipes to service the upper levels. To prevent gas and other noxious airborne gases building up, if a pipe leaked, the shaft was provided with natural ventilation to atmosphere at the head of the shaft.

When BS2655 was first drafted, it is most likely that many of these existing shafts had been used for the installation of new elevators and the authors probably thought it was a good idea to include the ventilation provision. In the early to mid 20th century, it was common practice to run services, other than for the elevator, up the shaft as it was a quick and convenient route. As we all know, modern standards now prohibit this practice, but this does not prevent M&E engineers still making the request quite regularly!

Other than in the most unusual cases, ventilation will be provided through the gaps around the entrances and the operation of the doors. This natural ventilation is sufficient to provide equivalent or enhanced free area ventilation than e.g. a 300mm x 300mm opening at the head of the shaft. Each door should have a least 6mm between the door panels and architrave/header for clearance. A similar dimension is available between the base of the doors and the threshold. These ventilation “slots” at each level provide conditioned air into the shaft through normal door opening and the piston effect of the car as it passes, therefore there is no reason to provide anything additional. However, in very special circumstances ventilation may be required if specifically called for by the client for reasons other than stated in Building Regulations and BSEN81-1 & 2.

For projects where Firecode HTM 81 ‘Fire precautions in New Hospitals’ may apply, it is recommended client agreement is obtained to not provide the lift shaft ventilation referred to in Paragraph 6.24 (b).

For refurbishment of existing lifts, the existing lift shaft ventilation openings can be retained and no additional ventilation arrangements are required.

We must all strive to question if codes and standards are appropriate before they are arbitrarily applied. Making small and regular changes to simplify the construction process for elevator systems will go some way to use less energy and materials that will count towards making our future more sustainable. □

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