



**GOVERNMENT OF INDIA**  
**Central Public Works Department**  
**Nirman Bhawan**  
**New Delhi – 110011**



सत्यमेव जयते

OFFICE MEMORANDUM

NO. DG/AMENDMENT(E&M)/HVAC(2017)/2      Dated 17.07.2018  
 ISSUED BY THE AUTHORITY OF DIRECTOR GENERAL, CPWD

**Sub:- Amendments in General Specifications for Heating, Ventilation and Air-Conditioning (HVAC) Works-2017**  
**HVAC (2017) - Amendment No. 2**

As recommended by Specification Committee in the 64<sup>th</sup> meeting held on 22<sup>nd</sup> June 2018 and approved by DG, the following amendments are hereby ordered in General Specifications for Heating, Ventilation and Air-Conditioning (HVAC) Works-2017:

S. No.	Para No.	Existing Provisions	Amended Provisions
1.	2.9.2.1	<p><b><u>CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS-Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations:</u></b></p> <p>National Building Code of India <b>2005</b> specified the ventilation requirement as per following table:.....</p>	<p><b><u>CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS-Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations:</u></b></p> <p>National Building Code of India <b>2016</b> specified the ventilation requirement as per following table:.....</p>
2.	2.9.2.4 (iii)	<p><b><u>CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS-Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations- CMM required for Basement Parking Ventilation:</u></b></p> <p>Minimum <b>12</b> air changes/hrs. are required to be provided.</p>	<p><b><u>CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS-Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations- CMM required for Basement Parking Ventilation:</u></b></p> <p>Minimum <b>6</b> air changes/hour <b>subject to fulfilling requirements of local Fire Authorities</b> are required to be provided.</p>



3.	2.9.2.6 (ii) (b)	<p><u>CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS- Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations- Selection &amp; Installation of Fans- Basement Car Parking Ventilation:</u></p> <p>All exhaust fan provided for the scheme, shall be fire rated for 900°C for 2 hrs.</p>	<p><u>CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS- Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations- Selection &amp; Installation of Fans- Basement Car Parking Ventilation:</u></p> <p>All exhaust fans provided for the scheme, shall be fire rated for 250°C for 2 hours. Exhaust fans shall be connected using circuit integrity cable.</p>
4.	2.9.2.6(ii) (c)	<p><u>CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS- Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations- Selection &amp; Installation of Fans- Basement Car Parking Ventilation:</u></p> <p>Normal ventilation fans for min. 12 air change/ hrs are kept on during working hours. However CO2 sensor may be provide which will continuously monitor the air quality and operate the normal fans only when required and there by conserve energy.</p>	<p><u>CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS- Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations- Selection &amp; Installation of Fans- Basement Car Parking Ventilation:</u></p> <p>Normal ventilation fans for minimum 6 air changes/hour <b>subject to fulfilling requirements of local Fire Authorities</b> are kept ON during working hours. However, CO2 sensor may be provided which will continuously monitor the air quality and operate the normal fans only when required and there by conserve energy.</p>
5.	2.9.2.6 (ii) (d)	<p><u>CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS- Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations- Selection &amp; Installation of Fans- Basement Car Parking Ventilation:</u></p> <p>For each zone, zonal electrical panel is required to be provided which shall get the signal from fire alarm panel to activate the fans in case of fire</p>	<p><u>CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS- Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations- Selection &amp; Installation of Fans- Basement Car Parking Ventilation:</u></p> <p>For each zone, zonal electrical panel is required to be provided which shall get the signal from fire alarm panel to activate the fans in</p>

		to achieve 30 air changes per hr.	case of fire to achieve minimum of 12 air changes per hour.
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6. Para 2.9.2.5 :

CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS- Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations- Calculation of Fan Static:

Existing Provision:

Calculation of Fan Static-

- i) Pressurization system for lifts lobby, lift shaft, stair case shaft -  
As per NBC part – 5 fire and light safety the following pressure are to be maintained for various shafts in high-rise building more than 25 mtr. in height-

Building Height	Pressure Difference	
	Reduce Operation (Stage 1 of a 2 Stage system) (Pa)	Emergency operation (Stage 2 of a 2 stage or single stage system)(Pa)
Less than 15 m	8	50
15 m or above	15	50

- ii) If possible the same levels shall be used for lobbies and corridors, but level slightly lower may be used for these spaces if desired. The difference in pressurization levels between staircase and lobbies (for corridors) shall not be greater than 5 Pa.
- iii) For Basement Parking Ventilation the static can be calculated by duct friction method using a ductolator.

Amended Provisions:

CHAPTER : SYSTEMS AND SYSTEM REQUIREMENTS- Mechanical Ventilation (For Non Air Conditioned Areas)- Design Considerations- Calculation of Fan Static:



Sl. No.	Component	Height of Building		
		Less than 15 m	15m to 30 m	More than 30 m
(1)	(2)	(3)	(4)	(5)
i)	Internal staircase not with external wall	Pressurized except for residential buildings (A-2 and A-4)	Pressurized	Pressurized
ii)	Internal staircase with external wall	Pressurized except for residential buildings (A-2 and A-4) or Naturally Ventilated	Naturally Ventilated or Pressurized	Cross Ventilated or Pressurized
iii)	Lift Lobby	Not required at ground and above. However lift lobby segregation is required for lift commuting from Ground to Basement	Naturally Ventilated or Pressurized	Cross Ventilated or Pressurized

**NOTE:**

- 1) The natural ventilation requirement of the staircase shall be, achieved through opening at each landing, of an area 0.5 m<sup>2</sup> in the external wall. A cross ventilated staircase shall have 2 such openings in opposite/adjacent walls or the same shall be cross - ventilated through the corridor.
- 2) Enclosed staircase leading to more than one basement shall be pressurized.

Lift lobby with fire doors (120 min) at all levels with pressurization of 25-30 Pa is required. However, if lift lobby cannot be provided at any of the levels in air conditioned buildings or in internal spaces where funnel/flue effect may be created, lift hoist way shall be pressurized at 50 Pa. For building greater than 30 m, multiple points injection air inlets to maintain desired pressurization level shall be provided. If the lift lobby, lift and staircase are part of firefighting shaft, lift lobby necessarily has to be pressurized in such case, unless naturally ventilated.



Superintending Engineer (E) TAS

To,

1. All SDGs, ADGs and CEs of CPWD/PWD Delhi with the request to bring into notice of all concerned. **(Through Website Only)**
2. File No.E-9038254/10(6)/64<sup>th</sup> Specification Committee/CE(E)CSQ/2016

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