

**RETHINKING CONSTRUCTION  
MANAGEMENT  
PRACTICES TO ATTAIN  
SUSTAINABLE DEVELOPMENT  
GOALS**

**(VOLUME - 1)**

**Chief Editor**

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## EVALUATION OF FIRE SAFETY NORMS IN CONSTRUCTION PROJECTS OF LUCKNOW

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### Abstract

In this paper, the aims to investigate the concept of building and fire safety on job sites, the National Building Code of 2016 offers rules and guidance. Fire safety is an important concern in all types of construction. The high level of national concern for fire safety is reflected in limitations and design requirements in building codes. A legal framework for ensuring fire safety on construction sites is provided by the Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act of 1996, The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules of 1998, as well as numerous other state regulations. Fire can have a devastating impact on anybody who is unfortunate enough to be near it. We all know that the flames and heat from a fire can cause a great deal of harm – from breathing the hot air killing a person instantly to life threatening or life changing burns on the body.

Fire is a frequently occurring disaster that may be caused by nature, humans, and/or both. Fire leads to fatalities and also material loss. Also besides, it may damage the environment, facilities and infrastructures, public facilities, and may also create disturbance in the society's life and livelihood. This study aims to evaluate the implementation of fire safety measures in residential building. Fire poses a major threat to various occupancies in India. Almost every day some fires are reported by media across the country. These fires not only resulted in the loss of many precious life and injuries to many but also inflicted heavy property loss.

**Keywords:** Fire Safety Norms, National building code 2016 (Part-4), Strategies for fire safety, Fire protection engineering, Construction Industry.

## **Introduction**

Through the centuries fire has always remained an integral part and parcel of human life. There has been an intimate connection of fire with the cultural growth of humanity. If we go through the historical growth of anthropology, we can easily trace out that this cultural growth of humanity was not that easy. It is a hard and bitter fact that with the technological developments the modern cities are becoming much advance with the presence of number of multi-storeyed buildings, malls, multiplexes etc. and hence giving rise to fire-problems. Thousands of high rise buildings have already constructed in metros and major cities in India, and thousands are under construction. Because of its peculiar nature, fire in residential buildings in particular, high rise buildings become more complex and the salvaging operations become more difficult and sometimes even resulting in many deaths and huge property losses.

## **Part 4 of the National Building Code (NBC) of India, 2016 Fire and Life Safety'.**

It covers the requirements for fire prevention, life safety in relation to fire and fire protection of buildings. The code specifies occupancy-wise classification, constructional aspects, egress requirements and protection features that are necessary to minimize danger to life and property from fire. It specifies the demarcations of fire zones, restrictions on constructions of buildings in each fire zone, classifications of buildings based on occupancy, types of building construction according to fire resistance of the structural and non-structural components and other restrictions and requirements necessary to minimize danger of life from fire, smoke, fumes or panic before the buildings can be evacuated.

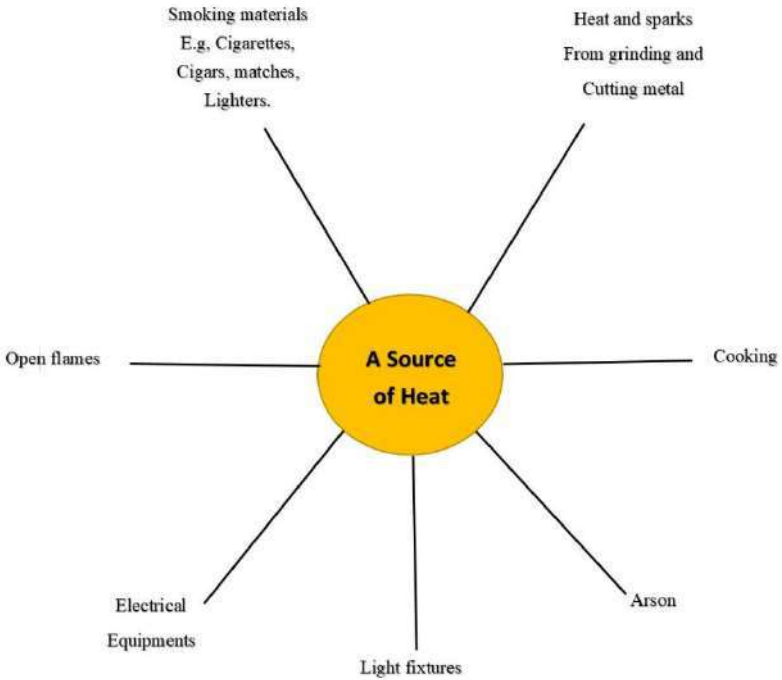
## Literature Review

Ignacio Adeo, *et.al* 2012; Emergency plans provide for various actions, such as evacuation routes and assembly points by moving through escape routes. Littlewood *et al.*, 2017; the emergencies on construction sites due to fire are capable of causing devastating consequences on the buildings and workers employed there. Khorasani *et al.*, 2014; Accumulations of flammable paper-based products: placed in adjacent locations to heat sources. These products include files, papers, and books. McDermott *et al.*, 2010; Open fire doors: that could allow flames and smoke to spread through the building and prevent safe egress from the building during fire events. Troitzsch, 2016; Active and passive fire protection and prevention measures, as mandated by fire codes, could significantly reduce fire hazards. Shang *et al.*, 2013; the risk is even higher, in the absence of measures for managing emergency evacuations, due to congestion at the main exits. Sutapa Das *et al.*, 2013; India lacks guideline for fire safety at construction sites. While in India, infrastructure is booming and at the same time many devastating fires have taken place in recent years, it is high time to formulate guidelines to control site fire. Xiang Feng *et al.*, 2021; Fire is a kind of sporadic local disaster phenomenon. The building fire in the fire has brought very serious losses to people's life and property. Saurabh Golani, Civil Engineering Department, Indus University, Ahmedabad India *et.al*. 2021; this study develops an approach to integrate fire safety assessment and decision making. Methods used includes; physical observations, document review and questionnaire survey. The study finding shows which factor is more important and minimum fire safety factors required in high-rise residential building the approach can be used to help to reduce the probability of fire occurrence and severity of possible consequences during the fire hazard.

### Components of Fire



**Fig 3:** A source of fuel



**Methodology**

In this study area is identified and also collects all the information regarding the study area. The quantitative research method adopts a deductive and objective view, which is characterised by tangible data such as count weight, mass and other physical measures. The study area is based on how to decrease the evacuation time in high rise building and safely evacuation. Main vision of this phase is to study about various research and theories regarding evaluation of fire safety norms in Construction project and identifying the best technique evacuation time in construction.

**Discussion**

A fire safety plan should be proposed before laying out the fundamental of any organization. From the statistical dada we can conclude that fire has the potential to occur at any place and cause destruction to life and property. Smocking and naked flamed are strictly controlled or banned entirely.

**Table 1:** Survey of causes of fire.

RESPONDENTS	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Questions																				
1. Overloaded circuits/short	5	1	5	5	1	2	1	5	3	3	5	1	2	1	5	5	1	5	1	5



circuits.																												
2. Flammable gases and liquid.	1	2	5	5	1	2	5	3	3	5	5	2	1	5	5	2	1	5	5									
3. Hot working.	1	4	5	5	1	3	3	3	3	3	3	3	3	1	5	5	4	1	3	3								
4. Temporary lighting and lamps.	1	3	5	5	2	2	3	3	3	3	3	2	2	5	5	2	1	3	3									
5. Portable heaters.	1	2	5	5	1	3	4	4	3	3	4	4	3	1	5	5	1	1	4	4								
6. Fire retardant scaffold and temporary covering materials.	2	1	4	5	1	2	4	2	3	3	2	4	2	1	5	4	2	2	4	2								
7. Faulty fuses.	5	2	5	5	1	1	5	4	3	3	4	4	1	1	5	5	3	5	5	4								
8. Poor inspection.	3	3	5	5	2	1	3	3	3	3	3	5	1	2	5	5	4	3	5	3								
9. Plugging too many things in same extension cord.	1	4	5	5	2	3	4	4	3	3	4	3	3	2	5	5	3	1	3	4								
10. Loose connection	1	3	4	5	1	2	4	4	3	3	4	4	2	1	5	4	2	1	4	4								
11. Not properly assign instruction of sign board an equipment																												
12. Lack of Awareness.	2	1	5	5	2	1	4	5	4	3	5	3	1	3	5	5	2	2	3	5								
13. Chemicals hazardous substances.	3	2	5	5	1	3	3	2	5	3	2	4	3	2	5	5	1	3	4	2								
14. Heating equipments.	1	3	5	5	2	1	4	3	4	3	3	3	1	1	5	5	2	1	3	3								

**Conclusion**

Fire accident in buildings is becoming a threat now a day which leads to the loss of human beings and property at large. For mitigating a fire in any occupancy, whether it is a business house or in a factory or in a residential building, require a deep understanding about the problem. Fire Safety norms are very rarely included in Building Rules and are required to be incorporated in the local building regulatory documents. Current fire protection measures lead to an unquantified level of fire safety in buildings, provide minimal strategies to mitigate fire hazard, and do not account for contemporary fire hazard issues. Implementing key measures that include improving fire protection features in buildings, proper regulation and enforcement of building code provisions, enhancing public awareness, and proper use of technology and resources are key to mitigating fire hazard in buildings.

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