



# A Comprehensive Review of Prevailing Construction Safety and Security Measures in the Real Estate Sector of Dhaka, Bangladesh

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## ARTICLE INFORMATION

Received: December 12, 2023  
Revised: February 08, 2024  
Accepted: February 22, 2024  
Published online: March 20, 2024

**Keywords:**  
Construction Safety and Security,  
Challenges,  
Construction Safety Regulations,  
Construction Safety in various Sectors  
of Bangladesh.

## ABSTRACT

The real estate industry in Dhaka, Bangladesh is a vital contributor to the nation's infrastructure development and economic progress. However, the pursuit of construction progress in this burgeoning sector is not without risks, raising concerns regarding the safety and well-being of workers, residents, and the overall sustainability of projects. This research endeavors to illuminate the current state of safety and security measures within Dhaka's real estate sector, specifically focusing on residential buildings and the expansion of existing constructions. The study aims to uncover prevailing practices, challenges, and areas for improvement. Conducting a comprehensive survey involving stakeholders, such as workers, owners, site engineers, supervisors, and contractors, in the evolving locales of Bashundhara R/A, Banani, Mirpur DOHS, and Jolshiri Abashon, the study identifies several critical issues. Preliminary findings reveal a noteworthy lack of awareness among a significant number of workers regarding safety measures and their employers' responsibility to provide necessary safety equipment. Challenges stemming from poverty, insufficient supervision, and irregular monitoring by authorities exacerbate these safety concerns. This paper seeks to address these gaps by scrutinizing existing safety practices and identifying obstacles in the implementation of safety protocols. By doing so, it aspires to catalyze regional development authorities, property owners, and industry stakeholders to enforce and regulate the safety measures delineated in the Bangladesh National Building Code (BNBC). Moreover, the study underscores the need for concerted efforts to educate workers on the types of safety measures required and the responsibilities of various stakeholders in supplying safety equipment.

## 1. Introduction

The construction sector of Bangladesh is driving the economic growth towards greater expansion. This industry is often described as the foundation of infrastructure advancement. It is a significant contributor to the global economy, representing approximately 6% of the world's GDP and showing a trend of growth (World Economic Forum, 2016). As an emerging developing nation, the

construction industry has come to play a crucial part in the nation's economic structure. As per the report by the Bangladesh Bureau of Statistics (BBS, 2016), the construction industry's growth contributed for the noteworthy 7.67% surge in Bangladesh's GDP in 2016. In recent years, this sector has been recognized as the most hazardous industry. Compared to many other industries, accidents in this sector result in a higher number of fatalities, illnesses, and injuries. An annual average of

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This article is published with open access at [www.seu.edu.bd/seuja](http://www.seu.edu.bd/seuja)  
ISSN No.: 2789-2999 (Print), ISSN No.: 2789-3006 (Online)

108,000 workers suffers fatal injuries in the workplace, accounting for approximately 30% of all occupational fatalities. The likelihood of experiencing risks in this occupation is three to six times higher than in any other occupation. Tiwari et al. demonstrates the inadequate implementation of safety protocols, with a notable absence in multiple construction sites in India. The Malaysian construction industry is significantly impacted as well by the safety concerns at construction sites. In the year 2001, there were a total of 1,225 fatal injuries reported in the United States, resulting in an incidence rate of 13.3 fatalities per 100,000 employed workers, according to the Bureau of Labor Statistics (BLS, 2002). In 1996, Italy and Germany had construction fatality rates of 114.4 and 115.4 per 1,00,000 workers, respectively. Presently, the construction industry in Bangladesh comprises over one thousand companies actively engaged in various aspects of the sector. However, safety management issues are regarded as being of very poor quality in Bangladesh. In 2021, a study conducted by the Bangladesh Institute of Labor Studies (BILS) reported a total of 1,053 workplace fatalities and 594 injuries across the nation (Star Business Report, 2022). According to the 2022 report, the transport sector has seen the greatest number of fatalities among workers, with 513 reported deaths. The construction sector follows with 154, and agriculture, food processing, and day labour sectors have seen 87, 55, and 46 worker fatalities respectively (Dhaka Tribune, 2023). Based on various research findings, it is evident that over the period from 2008 to 2013, there were in excess of 800 fatalities on construction sites (Jamal, 2015). Every year, an estimated 150 individuals lose their lives as a result of construction accidents in Bangladesh. Neglecting the fatalities rate in the clothing sector, the construction industry could be considered as the top category on the list (Jamal, 2015).

The significant number of work-related accidents and fatalities occurring at construction sites nationwide is possibly the most devastating consequence of the present situation. A secure and productive work environment reduces the likelihood of serious workplace accidents, illnesses, and overall construction costs. The main issue at hand pertains to the pervasive deficiency of knowledge and guidance regarding safety measures within the construction industry, exacerbated by the absence of a safety-oriented mindset and the neglect of essential safety protocols. A combination of inadequate machinery, poor decision-making, negligence, and ignorance has resulted in incidents that are further exacerbated by the lack of proper training and safety equipment. In spite of the significant repercussions, the implementation of a health and safety culture has been demonstrated to be crucial in diminishing construction-related accidents and enhancing the industry's overall effectiveness and productivity. Hence, the main goal of this study is to offer significant perspectives on the essential conditions of safety and security in construction within the real estate industry in Dhaka, Bangladesh. It also examines the safety precautions currently implemented within the real estate sector

particularly in residential building construction and the difficulties associated with upholding these measures.

## 2. Methodology

A qualitative method of study is taken in this work towards obtaining an all-round understanding of construction safety and security parameters in Dhaka amid rapid growth of residential units. The methodology involves an in-depth analysis of the current situation through a comprehensive literature review that includes published and unpublished documents, newspapers, and online materials like websites, journals, articles, reports, newsletters, and statistics provided by the OSHA from Bangladesh. At the same time, a study of existing safety laws for construction in Bangladesh was conducted. Based on the acquired data, a structured questionnaire was designed and implemented in a survey through different construction sites. This research does not employ any particular sampling method, but rather seeks diverse opinions of diverse stakeholders in volatile real estate housing sector. The survey considers safety relevant information about the organization's workplace safety practices, emphasizing the safety adoption process drivers. One important aspect in the survey was identifying the major causes and effects that result when one fails to use safety measures. Furthermore, the opinions and suggestions from the different participants within the industry also contributed to ensuring proper execution of safety regulations during site operations. A pictorial representation of the overall methodology used in the research process is provided in the accompanying flow-chart below.



**Figure 01:** Research Methodology Diagram  
(Source: Author)

### 2.1. STUDY AREA

The study focuses on four strategically chosen locations within Dhaka, Bangladesh—Bashundhara R/A, Mirpur DOHS, Banani, and Jolshiri Abashon, Purbachol—to comprehensively capture the evolving landscape of real estate development in the city. These locations were selected with careful consideration to represent various stages of development within Dhaka. Jolshiri Abashon stands as a representative of a fully developing scenario, providing insights into the most recent conditions. Mirpur DOHS and Banani, on the other hand, serve as indicative of

an 80% constructed and 20% developing scenario, offering a balanced perspective on ongoing construction activities. Bashundhara R/A represents the scenario, having a ratio of 60% constructed and 40% developing situation. This deliberate selection of study areas ensures a nuanced understanding of the overall real estate landscape in Dhaka, accommodating both fully developed and rapidly evolving regions within the city.

## 2.2. DATA COLLECTION

The data was collected by creating questionnaires and conducting interviews with construction workers, site engineers, owners, supervisors, contractors, and other people directly involved in construction and operations within the selected areas. The questions were revolved around the current safety and security practices, challenges, and recommendations for improvement in the construction sector within the chosen areas.

## 3. LITERATURE REVIEW

### 3.1. INTERNATIONAL STANDARD PRACTICE FOR CONSTRUCTION SAFETY

Construction sector is one of the vital components of world economies, and it is also known for its inherent risks and safety challenges. Global standards have been developed to improve security and safety on building sites. Ten important guidelines and procedures that are widely accepted in the global construction business are highlighted below-

- **Personal Protective Equipment (PPE):** PPE including helmets, gloves, and high-visibility vests are required internationally to lessen occupational dangers (OSHA, 2023).
- **Safety Signs and Communication:** Prohibition, caution, and required signs are essential for increasing safety awareness and for effectively communicating important safety information (ISO 3864, 2011).
- **Clear Instructions and Training:** Prohibition, caution, and required signs are essential for increasing safety awareness and for successfully conveying security instructions (ISO 3864, 2011).
- **Site Organization and Housekeeping:** To avoid tripping, falls, and accidents, it's important to keep the area tidy and clear of clutter (NIOSH, 2017).
- **Proper Tool and Equipment Management:** To reduce accidents, it is worldwide standard practice to arrange equipment and use the appropriate equipment for jobs (Channell, 2021)
- **Use the Right Equipment for the Right Task:** Misuse of tools or equipment is a common cause of accidents. Steer clear of improvised tools. Instead, to complete the task more quickly and safely, utilize the appropriate instrument.

- **Emergency Response Plans:** Workers are guided by defined evacuation procedures when responding to fires, hazardous material accidents, and catastrophes (NFPA, 2018).
- **Engineering Controls and Safeguards:** Engineering controls, such as barriers and safeguards are used in safety procedures to protect employees from risks (OSHA, 2016).
- **Pre-Checks and Equipment Inspections:** Pre-checks and inspections are encouraged by international standards to guarantee that equipment and instruments are free of defects before use (WorkSafe Victoria, 2023).
- **Immediate Issue Reporting:** Workers must be trained to report flaws, near-misses, and safety concerns as soon as they arise in order to develop a reporting culture to avoid accidents (HSE, 2022).

These 10 worldwide construction safety and security guidelines offer a strong framework for enhancing security and safety on building sites around the world. These guidelines seek to lower the hazards connected with the construction sector and establish safer working environments, while regional variations may exist in reality (Safety Culture, 2022).



**Figure 02:** Safety Equipment for Construction Workers (Source: Author)

### 3.2. NATIONAL STANDARD PRACTICE FOR CONSTRUCTION SAFETY

Security measures are essential in order to safeguard construction workers from potential risks. Personal Protective Equipment (PPE) is required for many tasks such as safety harnesses to prevent falls from elevated areas, safety goggles and face shields for protection against hazardous materials, helmets to protect the head from falling debris etc. By taking these measures, the chance of accidents and injuries on construction sites is significantly reduced. A summary according to BNBC is shown in Table

01-

**Table 01:** List of National Standards and Effectiveness of PPE for Construction Workers . (Source: Noor, 2013)

PROTECTING BODY PART	PERSONAL PROTECTIVE EQUIPMENT	STANDARD OF THE EQUIPMENT	PROVIDES PROTECTION FROM	REMARKS
Head protection	Helmet	BDS 1265 BDS 1266	Falling debris/materials from a scaffold platform Overhanging weights Loose material being kicked into an excavation Material falling of a load being lifted by a crane or hoist Hitting head against machinery or other sharp projections of a construction site	Majority of the head injuries can be avoided
Hand	Gloves Jelly	Leather gauntlet gloves with canvas or leather cuffs (Para 3.9.6 of BNBC)	Removing formwork (Para 3.7.2 of BNBC) Operating vibratory machines For welding and glass-cutting (Para 3.1.2 of BNBC) For applying polishes Working with rough, sharp or jagged surfaces Splashes from hot, corrosive or toxic substances (bitumen, resins) Conducting electrical work in humid conditions Operating energized electrical installation (Para 3.3.2 of BNBC) When involved in pile driving Handling glass sheets, glass remnants, waste glass pieces and fiber glass	
Footwear	Safety boots	-	Gas cutters and welders should wear safety boots particularly (Para 3.1.2 of the BNBC) Prevents burns from highly corrosive wet cement or concrete Shoes shall be used in terracing work (BNBC para 3.11.5.4)	Necessary for all kind of construction work
Eye protection		A helmet or a hand-held face shield that complies with BDS 1360 Safety goggles of BDS 1360 (Para 3.1.2 of the BNBC)	Any arc welding work Slag removal from welds by clipping	
Skin		Section 3.10.4	Splash liquid or other materials liable to injure the skin	
Safety belt/harness			Falls from heights	

## 4. RESULTS AND DISCUSSION

### 4.1. DIFFERENT SCENARIOS FROM PHYSICAL SURVEY

After conducting physical survey at 12 different construction sites throughout Dhaka, the following characteristics were noted-

1. In certain sites, the workers were found to be performing their duties without the utilization of any fall protection equipment. As specified in the BNBC-2006, it is very important to provide proper protection for the slab to prevent any potential fall hazards. Guardrails are required for the edges of slabs, openings in walls or slabs, and the perimeter of slabs as well as staircases to prevent falls. However, some of the sites did not comply with the safety regulations for workers.
2. The workers were performing their duties without the necessary protective gear such as- hand gloves and safety boots. However, there were cases where the workers were not utilizing the safety equipment's during construction activities of their negligence and unwillingness. The BNBC-2006 is not content with the type of working environment provided.
3. In some sites the workers engaging in painting and tiles found working without using gloves, respirators, or eye protection. Potential impact risks can arise from airborne debris resulting from a variety of activities, including chipping, grinding, drilling, and woodworking. These small objects or, particles have the potential to cause significant harm to the eyes.

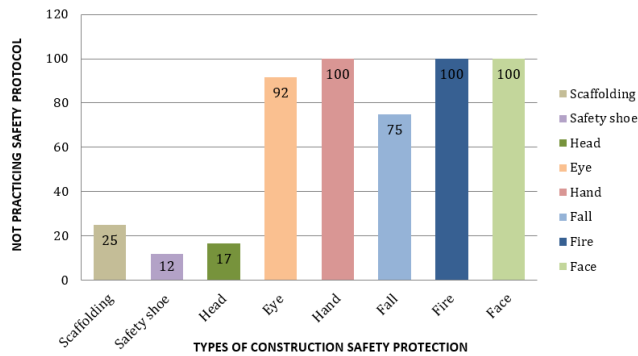
4. In accordance with the BNBC-2006, it is imperative to ensure measures are in place to prevent falls when using staircases and elevators. It was found that the contractor had provided safety belts; however, the workers were not utilizing them during the installation of the lift. It was quite surprising to observe the circumvention of safety regulations in the stair and lift core area of the construction project. Consequently, workers are at risk of falling from a height, potentially resulting in fatal injury.
5. In some sites employees are not provided with adequate medical treatment in the event of an injury, resulting in workers having to cover the cost of their own treatment.

### 4.2. CURRENT CONSTRUCTION SAFETY STATUS IN BANGLADESH

The results of the investigation are presented in Table 02. The safety measures are categorized into four levels - Poor, Satisfactory, Superior, and Outstanding - based on the extent to which employees and the workplace adhere to them for safety purposes. If safety precautions were not implemented in this particular area, it is categorized as "No" in terms of safety. The safety measures observed in this research are found to be inadequate based on an examination of the survey data. A substantial portion of the site does not have sufficient safety measures in place. If any protective measures exist, they are grossly insufficient to safeguard workers from potential hazards. There is no provided equipment or gear to safeguard the hands or faces of individuals on the premises.

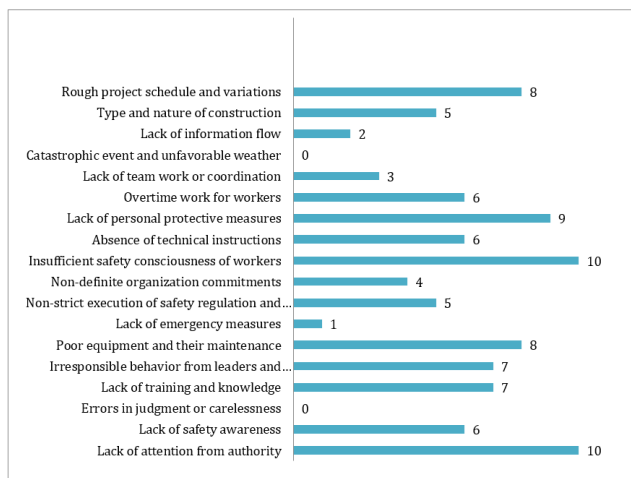
**Table 02:** Prevailing Construction Safety and Security Measures in Real Estate Sector Dhaka

LOCATION	SITE	NO.OF PERSONS	SCAFFOLDING	PROTECTION						
				SAFETY SHOES	HEAD	EYE	HAND	FALL	FIRE	FACE
Bashundhara R/A	Site 01	14	Poor	Poor	Poor	No	No	No	No	No
	Site 02	11	poor	Good	Poor	No	No	No	No	No
	Site 03	13	No	Poor	Poor	No	No	No	No	No
	site 04	10	Poor	No	No	No	No	No	No	No
	Site 05	15	Poor	No	Poor	No	No	No	No	No
Mirpur DOHS	Site 06	08	Good	Good	Good	No	No	Poor	No	No
	Site 07	11	Poor	Better	Good	No	No	Poor	No	No
Banani	Site 08	12	Better	Best	Best	Poor	No	Poor	No	No
Jolshiri Abashon	Site 09	09	No	Poor	Poor	No	No	No	No	No
	Site 10	13	Poor	Poor	No	No	No	No	No	No
	Site 11	12	No	No	Poor	No	No	No	No	No
	Site 12	09	Poor	No	Poor	No	No	No	No	No



**Figure 03:** Prevailing Safety Scenario in the Selected Areas (Source: Author)

Based on the findings of the survey, it was observed that most construction sites enforced the use of safety shoes among their personnel to safeguard their feet; however, a substantial 88% of these shoes were deemed to be in subpar condition. According to Figure 03, head protection measures were not being practiced at 17% of the assessed sites. Of the total number of sites observed, 25% were found to have a lack of scaffolding. However, among those sites which did have scaffolding, the majority (75%) utilized traditional bamboo and rope scaffolding. The survey findings revealed that none of the employees or, workers of these sites were using any form of facial protection. Moreover, none of the sites had contingency plans in place in the event of an unexpected fire. Additionally, a considerable proportion of construction workers



**Figure 04:** Challenges in Practicing Construction Safety

Sources: SRS annual report (2010), SRS annual report (2011), SRS annual report (2012), SRS annual report (2013), SRS annual report (2014), SRS annual report (2015), kadiri et al (2014), Amaka (2013), Abdul et al (2008), Building Standard (2013), Farida (2010), OSHA Report Bangladesh (2014), Vhokto (2014), Parves et al (2015), Salma et al (2010), Fabiha et al (2016), Chowdhury and Tanim (2016), Mahbub (2015), Islam et al (2015)

demonstrate inadequate knowledge of fundamental safety protocols necessary on construction sites. There is a lack of awareness about the responsible party for providing safety equipment.

Nevertheless, a notable discovery from the empirical investigation is that prestigious areas such as- Banani and Mirpur DOHS demonstrate a tendency to emphasize the adoption of enhanced safety measures, not only as an essential requirement for construction but also as a means to cultivate a distinguished image in order to appeal to prospective purchasers. Conversely, locations with lower levels of wealth often receive less focus in terms of essential safety precautions and procedures.

### 5. RECOMMENDATIONS AND SUGGESTIONS

In order to improve construction safety, it is essential to prioritize greater worker safety knowledge and training, strict adherence to safety regulations, and improved project planning and monitoring. In order to establish a more secure building environment, it is crucial to address issues related to poverty, ensure the widespread availability of high-quality safety equipment, and establish a robust monitoring and accountability framework for local development authorities. These measures would not only protect the well-being of workers but also contribute to the overall development of the construction industry in Bangladesh.

- Employers and contractors must abide with the law for the sake of the health and safety of their employees, to manage and lessen potential dangers and accidents; it is essential for the creation of safe workplaces, frequent site inspections, risk assessments, and the implementation of control measures.
- Contractors should give construction safety top priority in their bid packages to effectively compete and reduce financial risks. This can be achieved by achieving competitive safety and health standards.
- Maintaining accident registers at their construction sites is mandatory for contractors; these registers must include information on all accidents, from minor injuries to serious and deadly situations. It is mandatory for all newly hired personnel to undergo health and safety induction training, which covers basic subjects like fire safety and first aid.
- It is important for site supervisory staff to be aware of and to share their knowledge of Occupational Health and Safety with their colleagues. It is essential to integrate safety officers in order to establish regulations, cautionary signals, and other protective measures for overseeing the various locations. Workers have the right to be fully educated on safety precautions at a construction site before the start of a project.
- It is mandatory for employees to correctly utilize their

personal protective gear in accordance with the instructions provided by their employer or, the individual overseeing the work site. It is important for individuals to handle equipment with caution, avoid improper use, and promptly communicate any malfunctions or, issues to their supervisors.

- Construction sites must undergo regular inspections to ensure compliance with the health and safety standards set out by the Occupational Safety and Health Administration (OSHA). This is the responsibility of Occupational Health and Safety Management. In order to manage construction sites in a safe and healthy manner, all parties involved in the project must ultimately contribute in the ways that are appropriate.

## 6. Conclusion

In summary, the safety practices within the construction sector in Bangladesh present a significant challenge. The main contributing factors to substandard safety standards are a lack of awareness among employees, insufficient training, and reluctance on the part of management and authorities to prioritize safety. Every year, the failure to take proper precautions at construction sites leads to a significant number of injuries and deaths. According to Dodo, Health and Safety is an essential component of the construction industry as it directly impacts the well-being of workers. An individual can effectively fulfill their responsibilities only when they are confident that they can mitigate potential accidents effectively and will receive excellent care. According to Okeola, the focal point of Health and Safety in construction lies in the notion that, ensuring the safety and well-being of individuals in the workplace by implementing suitable measures to prevent accidents, injuries, and illness, and ensuring a suitable professional atmosphere. The real estate sector in the nation is experiencing significant growth; however, there is a notable deficiency in attention to labor regulations and safety protocols. The primary focus of the industry should be on implementing stringent safety protocols rather than prioritizing financial gain. It is imperative for the government, particularly agencies like RAJUK, to implement rigorous safety measures to protect the lives of workers in the construction industry.

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