Safety Analysis Construction sites in India.

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***Abstract* - Safety is an important aspect in relation to construction works. Construction work involves risk of fatal injuries or even death. Safety is a major concern and can be ensured with proper equipments, safety precautions and education about risks involved. Even the country's government can play significant role by issuing strict rules and regulations to be followed at construction sites. In my view, workers must also be provided with minimum life cover according to their human value. Thus, the research work has been done to ensure the safety of masons, laborers, project managers and everybody related to construction work.**

Keywords: Construction technologies, Safety measures, Government control.

1. INTRODUCTION

Safety is the preservation of the lives, property and environment by taking preventive reserves to prevent accidents, destruction and pollution, through accident prevention programs. It is the state of being "safe", the condition of being protected against physical, mental, spiritual, social, financial, political, emotional, psychological, educational or other types or consequences of damage, failure, error, accidents, harm or any other event which could be non-desirable.

Safety can also be defined as the control of known hazards to achieve an acceptable level of risk. This can take the form of being protected from the event or exposure to something that causes health or economical losses or damages. It can include protection of people or of their possessions.

Safety is the condition of a "steady state" in an organization or place, doing what it is supposed to do. "What it is supposed to do" is defined in terms of public codes and norms, associated architectural and engineering designs, corporate insight and mission statements, and operational scheme and personnel policies. For any organization, place, or function, large or small, safety is a normative concept. It collates with situation-specific definitions of what is expected and acceptable.

2. PLACING THE FIGURES

Figure: Picture showing workers working with safety equipments, which are helmet and gloves.

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Figure: Picture showing workers at construction site.

Figure: Picture showing hoarding with cautious message.

Figure: Picture showing safety at construction sites.

2.1 Placing of graph

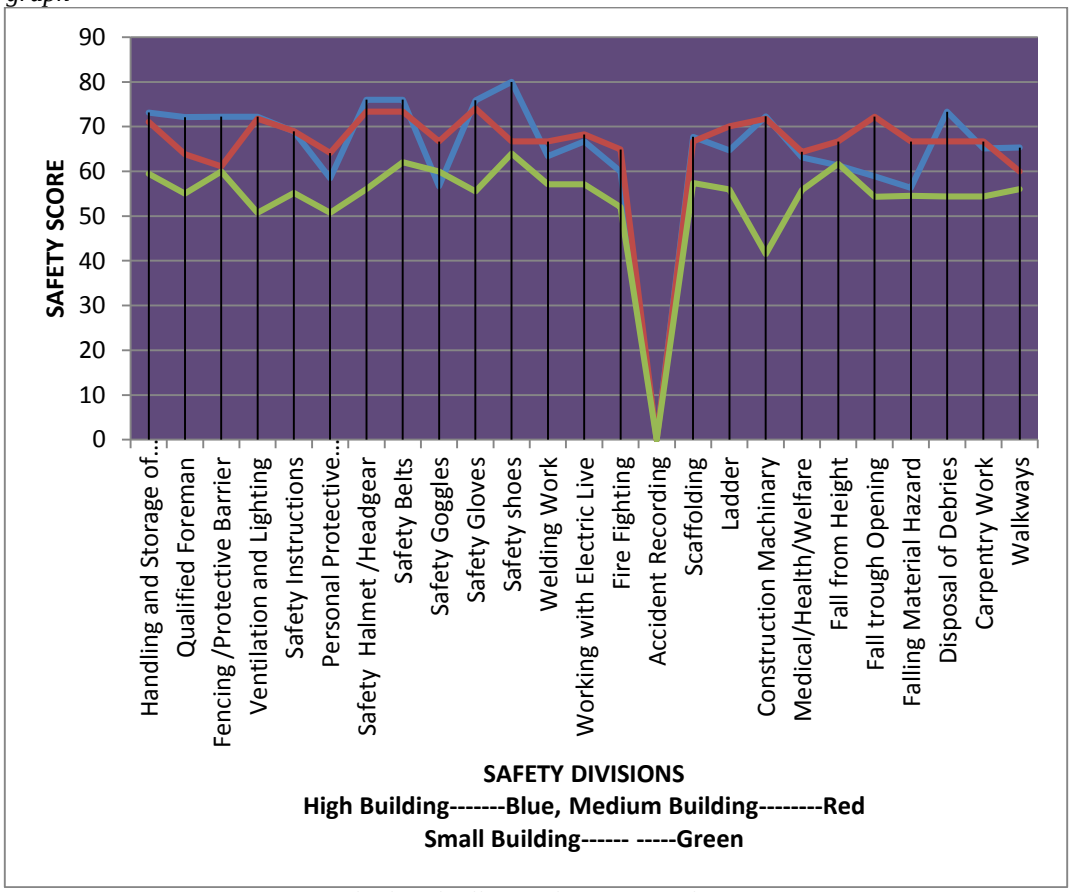

Figure: Graph Showing Score of Safety of Different Safety Divisions of High, Medium and Low Buildings

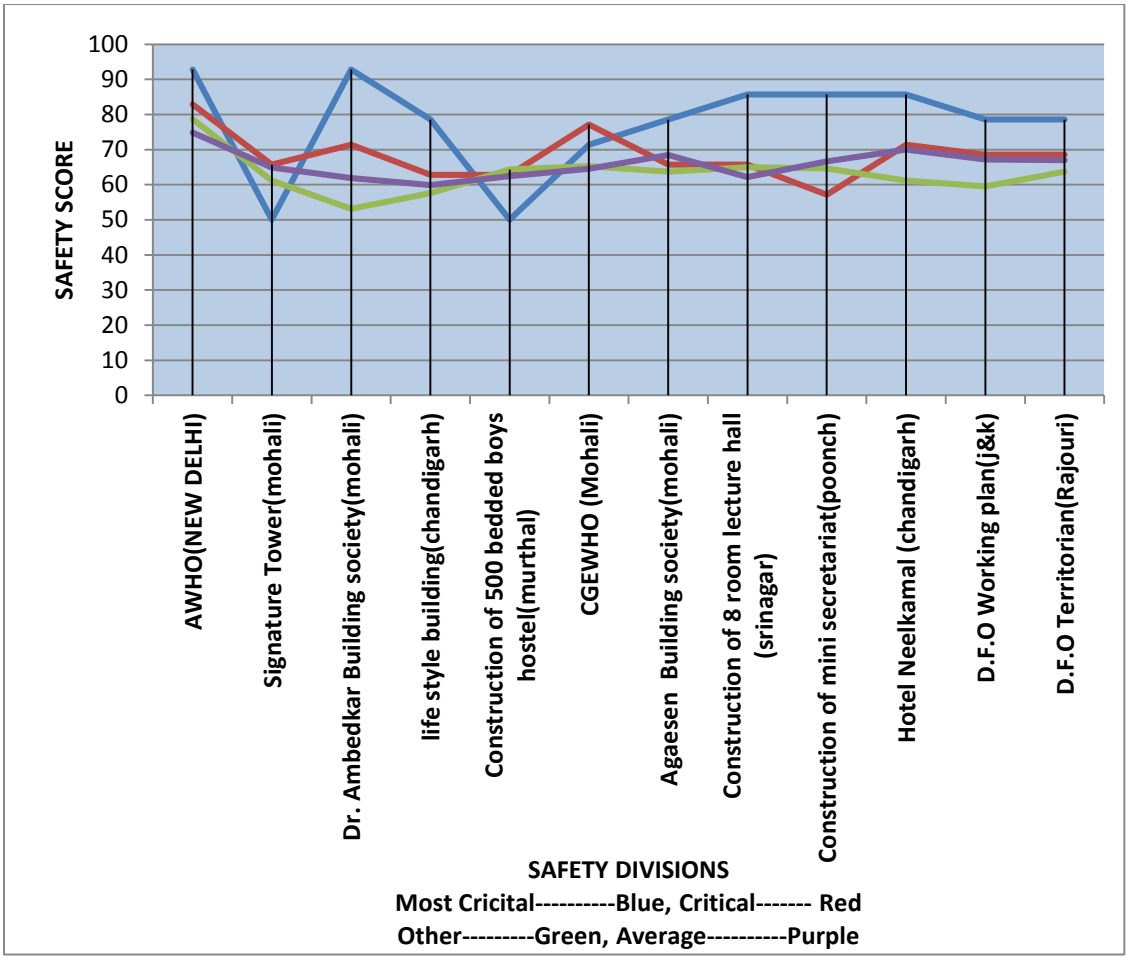

Figure: Graph Showing Score of "Most Critical", "Critical", "Other" Safety Provisions and Average Score of Safety Provisions implemented at Different Construction

2.2 Using and placing the equation

1) $$\frac{\sum [\text{No. of adhered statements} \times 100 + \text{No. of not adhered statements} \times 0]}{\text{No of applicable statements}}$$

The scores obtained for each building for different safety divisions or block was averaged to a single score by using this equation.

2) $x = (\sum x) \div n$

The above equation is applied to find out the average score procured by dividing the sum of score of all the divisions or head by the number of divisions.

3. RESULT TABLE AND DISCUSSION

Table: Result at a Glance of all the Buildings (Large, Medium and Small).

Buil-ding	Average Safety Score	Rating	Score of Most Critical Para-meters	Rating	Score of Critical Para-meters	Rating	Score of Other Para-meters	Rating
Large Buildings								
1	74.84	**G**	92.85	S	82.85	S	78.64	**G**
2	64.89	F	50.00	US	65.71	US	61.14	F
3	61.90	**F**	92.85	S	71.42	**US**	53.18	**P**
4	59.88	**P**	78.57	US	62.85	US	57.64	P
5	62.43	F	50.00	US	62.85	**US**	64.33	F
Medium Buildings								
6	64.51	F	71.42	US	77.14	US	65.28	F
7	64.48	**F**	78.57	US	65.71	**US**	63.69	F
8	66.60	F	85.71	US	57.14	US	64.64	F
Small Buildings								
9	62.17	F	85.71	US	65.71	US	64.96	F
10	70.06	F	85.71	US	71.42	US	65.14	F
11	67.21	F	78.57	US	68.57	US	59.55	P
12	67.00	F	78.57	US	68.57	US	63.69	F
G-Good, F-Fair , P-Poor, S-Safe & US-Un Safe								

DISCUSSION

As per the above table, the highest average safety score of large building is 74.84, which has a good rating and the lowest is 59.88, which has poor rating. The highest score of most critical parameter of large building is 92.85, which has safe rating and the lowest is 50.00, which has un-safe rating. The highest score of critical parameters of large buildings is 82.85, which has safe rating and the lowest is 62.85, which has un-safe rating. The highest score of other parameters of large buildings is 78.64, which has good rating and the lowest is 53.18, which has poor rating.

The highest average safety score of medium building is 66.60, which has a fair rating and the lowest is 64.48, which has fair rating. The highest score of most critical parameter of medium building is 85.71, which has un-safe rating and the lowest is 71.42, which has un-safe rating. The highest score of critical parameters of medium buildings is 77.14, which has un-safe rating and the lowest is 57.14, which has un-safe rating. The highest score of other parameters of medium buildings is 65.28, which has fair rating and the lowest is 63.69, which has fair rating.

The highest average safety score of small building is 70.06, which has a fair rating and the lowest is 62.17, which has fair rating. The highest score of most critical parameter of small building is 85.71, which has un-safe rating and the lowest is 78.57, which has un-safe rating. The highest score of critical parameters of small buildings is 71.42, which has un-safe rating and the lowest is 65.71, which has un-safe rating. The highest score of other parameters of small buildings is 65.14, which has fair rating and the lowest is 59.55, which has poor rating.

4. CONCLUSION

Accidents are taking place at construction sites and some are fatal. The workers get permanently disabled and fight for this menace. This study was taken in hand to find solution of the problem i.e. safety a construction sites in States of North India except Ladakh. Keeping in mind the predetermined objectives the following conclusion can be drawn from the analysis of data.

1. The Four divisions of safety: "Fire fighting at construction site" , "Use of Personal protective equipments", "Hazards Due to Fall from Height at Construction Site", "Falling material Hazard" and "Provisions of Walkways and Passages at Construction Site" need immediate attention due poor rating at most of the construction sites.
2. The overall scenario of safety in all such buildings in States of North India is miserable and requires immediate attention.
3. Most of the sites observe safety regulations for "Most Critical" and "Critical" parameters but ignore the "Other" parameters which are equally important form safety point of view.
4. The adaptability of safety measure also depends upon the awareness and motivation level of workers at site.

5. RECOMMENDATION

1. There is urgent need to implement and monitor the safety provision at all sites.
2. There should be sufficient quantity of Personal Protective Equipments which must also be used at site.
3. The provisions of fire fighting must be strictly complied.
4. In order to implement the safety provision a clause of safety must be added to the existing clauses of tender.
5. Heavy penalty must be enforced on violating the safety norms.

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