iJRASET
International Journal For Research in Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 5 **Issue:** VII **Month of publication:** July 2017

DOI:

www.ijraset.com

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor:6.887
Volume 5 Issue VII, July 2017- Available at www.ijraset.com

On Site Risk Analysis of Construction Project

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Abstract: ***Nowadays, construction sector is recognized as a field of risks and is characterized to be very complex, dynamic, and unique where uncertainties things are arise from various sources[18].The main objective of this paper was to identify the factors affecting occupational health risk during construction of high rise building & to assess the risk during different construction activities.***

Firstly the different risky events during construction of high rise building were identified. The factors affecting to occupational risk also identified. Also, various construction activities & consequences of risky events during construction activities were discovered. After finding factors affecting the occupational health risk, various construction activities and consequences of different risky events during various construction activities, the top ten factors and top three activities which will cause more occupation health risk will be find out and then interlinking of top ten factors with top three activities will be done. Then finally some remedial measures are suggested to avoid or to minimize of health risk of workers for those particular activities.

Keywords: Construction Activity, Risk Factors, Ranking

I. INTRODUCTION

Construction sector is a large sector for the labour in our country. A large number of workers in this sector are unsafe to the varieties of workplace accidents and occupational health problems.

According to ILO 2003, 'work-related fatalities in India estimates for 3, 10,067

The accidents in construction industry occurs due to the factors such as[19]**:**

A. Large number of small firms and self-employed workers[19]**.**
B. Small duration of construction activities at sites[19]
C. Workers are not familiar with the construction activity[19]**.**
D. New trade and techniques are involved in construction activity[19]**.**
E. New worker or unskilled labour and due to lack of training[19]**.**

As per the Report on Occupational Safety and Health for the Tenth Five Year Plan (2002-2007), 'Construction sector is one of the most unsafe segments of the unorganized labour in our country. A large number of workers in this sector are unsafe to the varieties of workplace accidents and occupational health problems. They are exposed to a wide variety of serious OSH hazards and the rate of fatal accidents in this industry is 4 to 5 times that of manufacturing sector. The workers are also exposed to hazardous substances, which causes serious occupational diseases etc. There is also a serious potential for fires due to storage and use of flammable substances and a potential for disasters due to collapse of the structures and subsidence of the soil on which the construction activity is being carried'[19]**.**

The focus and attention in this research are given to find out the risk factors which effects on the health of workers and total project.

II. RESEARCH OBJECTIVES

A. To find risk risky events during construction of high rise building.
B. To find factors affecting to occupational risk.
C. To find various construction activities & consequences of risky events during construction activities were discovered.
D. Find top ten factors and top three activities which will cause more occupation health risk will be find out and then interlinking of top ten factors with top three activities will be done.
E. Then finally some remedial measures are suggested to avoid or to minimize of health risk of workers for those particular activities.

III. METHODOLOGY

Methodology adopted for this study is shown in flow chart:

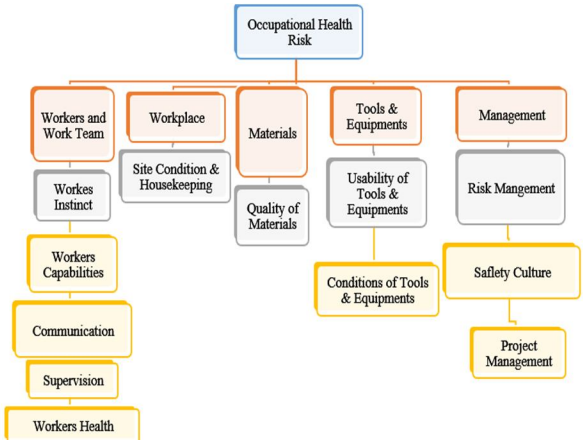

Figure 1. Risk factor in Construction Activity

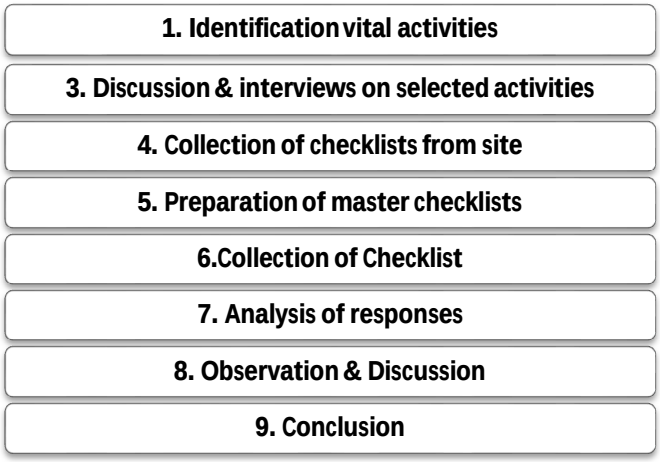

Figure 2. Methodology for Study

Activities listed below are the major contributors towards safety analysis and risk. This is the main reason for their selection. Negligence in executing these activities may be a serious threat to the structure.
Selected Activities are,

A. Identify risk event
B. Top ten risk factor
C. Top three activities which causes more occurrence on risk event
D. Suggesting remedial measures for risk factors

IV. DATA COLLECTION

A. Primary Data
1) Questionnaire Design:
a) Questionnaire survey/field survey is conducted by distribution & collection of forms from experts for
i) Identification of important factors causing hazards on site,
ii) Probabilities of various hazards on construction site during construction activities,
iii) Impact of risky events/consequences during construction & its probabilities, etc.
b) Questionnaires were prepared to get above stated data from expert personnel's in the field of construction. 2 data sheets/forms

were prepared. 1st form contains 12 factors & possible situations under each factor. Situations were ranked from worst situation to best situation. Experts have to reply according to their experience. 2nd form contains seven activities. This form is prepared to find out the occurrence of risky events during these activities. For this point scale 1-10 will be given. Experts have to reply according to their experience.

i) Questionnaire is shown as follows

ii) First form – for finding risk factors

iii) Second form – for finding activities

After giving the basic information to the expert personal, the questionnaire was handed over to the experts. These experts personal were from various groups, various firms but having experience at least more than 2 years. In this study, the average experience of the personal was 5 years.

Table No: 1- Sample questionnaire for risk factors

SR NO	FACTOR	RANKING				
		1	2	3	4	5
1	Irresponsible Workers					
2	New worker without skills					
3	If no Communication					
4	No safety awareness among the workers					
5	Project is poorly managed					
6	Lazy movements due to lack of training					
7	Improper tools and Equipments					
8	Older adults/Child workers					
9	Inferior quality of materials					
10	Old tools & equipments					

Table No: 2- Sample questionnaire for construction activity

SR NO	FACTOR	RANKING				
		1	2	3	4	5
1	Excavation					
2	Foundation					
3	RCC frame structure					
4	Brickwork & Plastering					
5	Plumbing					
6	Floor Finishes					
7	Painting					

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V. RESULT AND DISCUSSIONS

After collecting data by using method relative important index and weighted mean method.

Table No: 3 -Ranking of Risk Factor

SR NO	FACTOR	RANKING					RII
		1	2	3	4	5	
A	**Workers Instinct**						
1	Irresponsible Workers	0	0	0	6	10	**0.9250**
2	New worker without skills	0	0	0	7	9	**0.9125**
3	If no Communication	0	0	1	5	10	**0.9125**
4	No safety awareness among the workers	0	0	0	7	9	**0.9125**
5	Project is poorly managed	0	0	1	8	7	**0.8750**
6	Lazy movements due to lack of training	0	0	1	9	6	**0.8625**
7	Improper tools and Equipments	0	0	1	11	4	**0.8375**
8	Older adults/Child workers	0	0	4	6	6	**0.8250**
9	Inferior quality of materials	0	0	3	8	5	**0.8250**
10	Old tools & equipments	0	0	1	12	3	**0.8250**

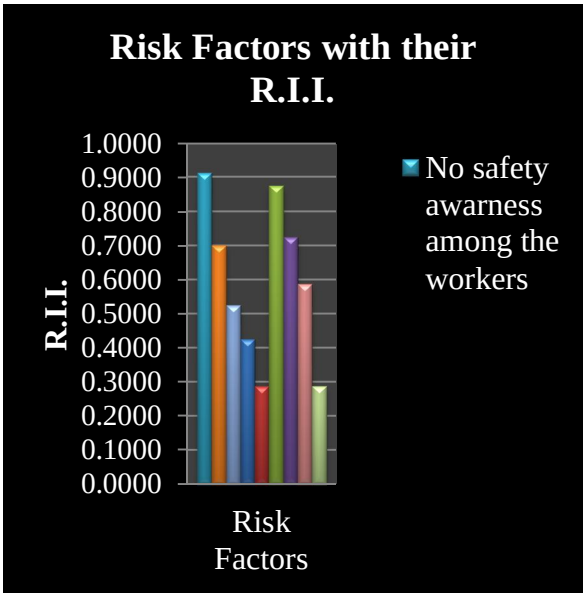

Figure 3: Relative Important Index for Risk Factor

Table No 4:Ranking of Construction Activity

Sr No	Factor	Ranking										WM
		1	2	3	4	5	6	7	8	9	10	
1	RCC frame structure	0	0	0	0	0	0	0	1	5	8	**8.688**
2	Excavation	0	0	0	0	0	2	3	11	0	0	**6.563**
3	Brickwork & Plastering	0	0	0	3	7	5	1	0	0	0	**4.250**
4	Foundation	0	0	0	3	8	5	0	0	0	0	**4.125**
5	Painting	0	0	2	8	6	0	0	0	0	0	**3.250**
6	Plumbing	0	3	10	3	0	0	0	0	0	0	**2.000**
7	Floor Finishes	2	10	4	0	0	0	0	0	0	0	**1.125**

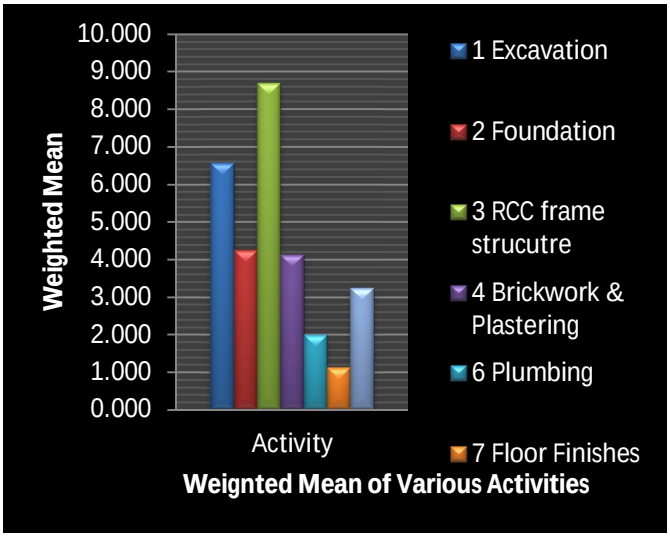

Figure 4: Weighted Mean Method for Construction Activity

VI. CONCLUSIONS

Rapid urbanization has increased the demand of residential & commercial dwellings in India, which has enhanced the construction activities since last decade. With the increased construction activities, workers health risk during construction also increased. Risk at construction industry is recognized as the second most risky area where worker are subject to fatalities & ill health problems. Till

date, risk assessment was restricted to major construction projects or nuclear projects. But, in this modern era with fast and sophisticated construction the occupational health risk his found to Omni-present at almost every construction sites. This fear has been expressed by most of the professional in the survey conducted in the present study and strong expressed the need of risk assessment in construction projects.

In this project more effort was given to find out the basic risks factors and risk occurring activities. In this project, after finding the risk factors, their ranking was done. So that it will give idea about the factors causing the highest risk during construction. Similarly by making of ranking of activities which causes themore occurrences of risky events, we will come to know the activities which cause more risky events. As suggested above, if proper solutions are find out to mitigate these risk factors andactivities then management will be able to complete that particular projects with effectively and by taking proper precautions regarding the health of their workers.

VII. ACKNOWLEDEMENT

I have a great pleasure to express my deep sense of gratitude and sincere regards to my guide Prof. Darade Milind, for his guidance and friendly discussion which helped me immensely in selecting this topic. His generous encouragement throughout my and helped me in completing this dissertation work.

I would like to thank our Head of Civil Engineering Department Dr. Sanjay K Kulkarni for allowing me to do this dissertation work. He has immensely helped inproviding all opportunities and facilities for the dissertation work.

I would also like to thank Dr. Ashok Kasnale Principal, Dr. D. Y. Patil School of Engineering and Technology, for providing all facilities at the right period of time. I am thankful to all the faculty members of Civil Engineering and library staff for helping me in this work.

Finally, I would like to thank all those who directly or indirectly helped me during my dissertation work.

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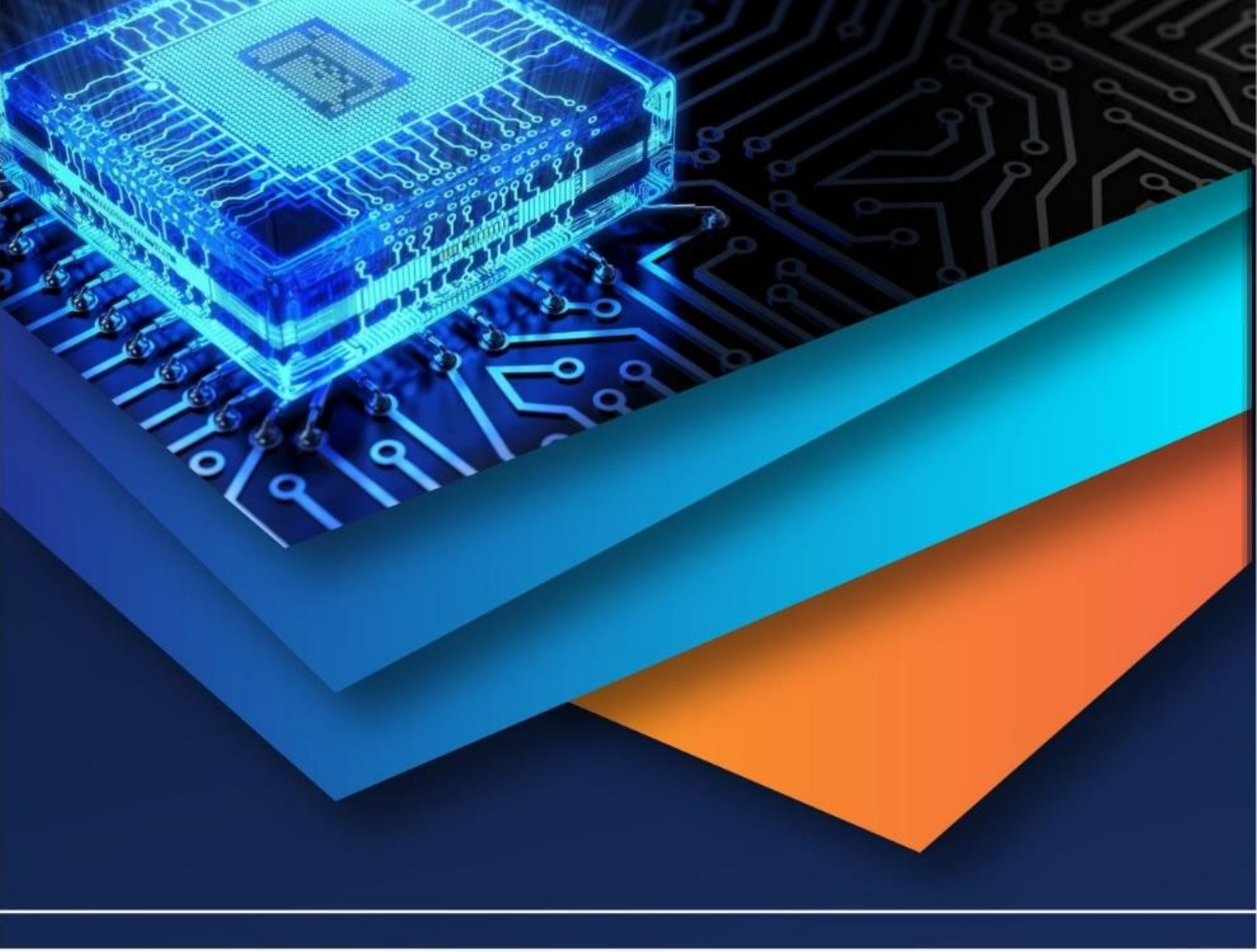

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