

## Labour Safety Concerns in Multi-Storied Building Construction: A Study on Occupational Health Risks, Injury Prevention, and Mental Stress Among Construction Workers

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### ABSTRACT

India is striding ahead in economic development towards laying emphasis on key industries. Ever since the implementation of the New Industrial Policy of 1991, the concentration has been on industrial development. Liberalisation has been brought into sphere in all activities, with particular attention to promoting over all industrial supremacy.

We have a strong presence in the World Trade Organisation (WTO) and are considered to be the representative of Developing Countries.

India is regarded as the safe Nation for Foreign Direct Investment (FDI) and Joint Venture (JV) by Multi National Companies. The MNCs are particular in bringing forward the Technology and Capital to India for the prosperity of both themselves and India.

This leads to formation of a number of industrial units thereby resulting in phenomenal growth of the outskirts of city.

All these give rise excellent employment opportunities for people of all calibre. The wage standard of the industry is also reasonable enabling people possess reasonable disposable income at their end.

There is a substantial movement of people from rural areas to city as job seekers.

The Construction Industry stands to benefit immensely by this and there have been brisk activities of construction of residential units in the city and outskirts of same.

The land cost getting shot up day by day, it is literally impossible for people to construct individual houses. The rent is also prohibitive in the city. People prefer, perhaps, under duress, to own an apartment for themselves by repaying the loan for a longer duration of time, thanks to institutional finance.

**Keywords:** Site Conditions, Age Factor, Compliance to Safety Standards, Working Culture, Attitude of Contractors.

### RESEARCH METHODOLOGY

Visit to Sites, Observation Method and Discussion with Site Personnel.

Contour	Details
No. of sites visited	2
No. of floors in each	4 and 7
Covered Car Park, Round the Clock Security, CCTV	Both Sites
GYM, Visitors Lounge, ATM, Super Market, Children Play Area	Second Site
Statutory Compliance	Both
Migrated Labour	In the Second Site
Use of Construction Machineries	In the Second Site
Site In Charge	Both Sites
Site Engineer/Project Manager	In the Second Site
Supply Chain Management	In the Second Site

### CHARACTERISTICS OF CONSTRUCTION LABOUR

As far as India is concerned, next to Agriculture, Construction Industry is only offering vast employment opportunities to people of all walks of life. Even today, majority of construction workers are “up to school” only. In other words, their educational qualification is not beyond the school. This is the characteristic feature of most of the site personnel.

The workers are, by and large, unorganised. For the same nature of job, people get different wages in different sites. And so are the treatment and consideration.

The situation of female workers is at the mercy of male workers. Construction Site is normally dominated by gents only.

Since the work is a tiresome one and does not carry the tag of show or pride, educated people prefer to have non construction jobs. The scenario is changing now and youngsters started showing interest in civil engineering and construction activities. This is a welcoming change.

Small builders have a chunk of labour at their disposal, at all times. None of them is in the permanent payroll of the builder but always at the sight of the builder. They are more like their servants. They are taken care either in the site or in any other activities, as these people do many small business.

Large Scale Builders too do not have more of people in their permanent payroll. That contains only a few important people who are essential to the builder to monitor and supervise the site activities and have effective co-ordination with the various contractors and suppliers.

They outsource personnel through Labour Contractors. Whatever way they are looked at, construction workers are unorganised and unprotected. Job security is virtually nil for them. Nevertheless, they show utmost commitment in the work and do a commendable job. Though they are poorly paid, they are highly committed in their profession. They have a pride in their feeling that their work show cases their knowledge in the profession and also is a pride for the people who occupy the apartments. This is an inborn feeling in them.

### **FACTORS HAVING DIRECT BEARING ON WORKMEN**

There are a host of factors which have a direct bearing on the construction workers. Construction work is known for its arduous nature. More of physical activities only contribute to the project execution. As such, it is all the more necessary that the operating personnel at the site must have at least the basic amenities and comforts to ensure that they put in their hard work at the site without any fear.

### **SITE CONDITION**

The condition of the site has a major role in determining the productivity of the labour. If the site is more of a slushy nature, naturally, the productivity of the labour will be quite low. They have to exert so much of energy in performing the work which quickly makes them exhausted. In fact, their level of performance in the evening compared to the one in the morning will be quite less.

It was noted, in the second site that the workers were showing resistance to do overtime, when they were asked to do so. Exhaustion was simply the cause for their resentment. They were finally persuaded with double payment for the extra hours of work. While, of course, the carrot of money made them yield to the pressure of the Site Engineer to stay back and work, the productivity was surely low.

Machines can produce rated output for a given time whereas humans cannot – beyond a time scale, irrespective of the overtime payment.

In the same way, the performance of workers is below the expected level, when they work in a cramped site. This is largely so in city construction where the site is surrounded by buildings. This will become more pronounced when construction equipments are pressed into service. The site personnel are fraught with a fear of possible accidents and this will undermine their performance. A sense of fear is chasing them and this will definitely dampen their spirit of working at the site.

Similarly, heaped materials, bricks and other construction items dumped all around at the site are also the reason with no lesser measure of importance in determining the productivity of the labour.

The same group of workers, when they work in a site at the outskirts of the city, which is having free space aplenty, will show remarkable performance and excellent productivity. From this, it is quite clear that the site conditions only determine the productivity of the personnel, to a great extent.

### **HEIGHT OF THE BUILDING**

It is true that taller the building, greater the risks are. The morale of the workers at the ground floor is high compared to that of the workers at the higher floors. There is a common feeling with workers that they are always exposed to risks and dangers at the higher altitude of work. They normally tend to avoid and would accept eventually under pressure only.

They may be armoured with PPE (Personal Protective Equipments) but they cannot be relieved of the fear of lack of safety.

They are also exposed to movement of materials and machines over them which further saps them off the enthusiasm of working. In fact, they are nervous all the time and nevertheless do the work.

Many workers have physical disturbances when working at higher altitudes. They suppress this feeling for fear of losing the job, when expressed. Constant pressure of this makes them vulnerable to accidents.

In this regard, it is worthwhile noting that “workers working at heights often find that gravity never takes a day off. Falls from heights occur so quickly that seldom does a worker or anyone have a chance to react quickly enough to prevent the fall or recover from the loss of balance”.

**(Source: Page No. 213, Book Name: Industrial Safety and health for Infrastructure Services. Author: Charles D Reese. Copyright@2009, by Taylor & Francis Group LLC. CRC Press, Taylor & Francis Group, 6000, Broken Sound Parkway NW, Suite 300, Boca Raton, FL 33487 – 2742. ISBN: 13: 978 – 1 – 4200 – 5380 – 7)**

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The Project Manager of the second site made a private remark that some accidents did take place in the previous projects but they were not due to any materials or machineries and were purely due to the workers themselves. It is true that the height of the building inflicts a sort of imbalance both physical and mental on the workers. Despite being fully protected with all personal covers, they succumb to accidents just out of psychological fears. This can be mitigated by giving proper training and safety precaution tips to the workers who were posted for such jobs.

It is the responsibility of the Project Manager to ensure that only young and energetic people are assigned with such taxing jobs at higher floors. The youngsters are adventurous and in fact prefer such assignments. They take pride in their valour.

It is normally a widespread practice that female personnel will not be assigned with any work beyond second floors.

The Labour Contractor may be in a hurry or may show a casual approach by sending just the required number of personnel as contracted by the builder, to the site. It is for the representative of the builder, ie, he Project Manager to demand and get the people of the calibre, age and experience, as needed to the project. The Project Manager must be kept accountable for this.

### **ENSURE TRAINING AND INCULCATE CONFIDENCE**

It is a fact that people learn only from mistakes. But, the lesson learnt should not be from a costly incident. In construction sites, preventive actions are always a Must. Any occurrence may prove to be fatal. This is more so at higher floors.

Most of the labourers do the work simply like a robot. They won't even look about and see what is happening around them.

It is a normal cause for accidents at higher altitude that they occur due to swinging machines or materials coming in hoist. Apart from telling the worker to do his work with dedication, it is all the more important for the Project Manager to educate the worker about the machineries in operation around him.

He should ensure that the workers are wary of the construction machineries in operation at the site. More than his (site personnel) part of work training, a committed and vigilant Project Manager would ensure that they are fully educated and trained about the various machineries that are vigorously operating at the site.

It is true that various qualified operators are there to operate different machineries, but all the site personnel should know at least to the extent of protecting themselves from such machineries, for their own safety of operation.

It is the duty of the Site Engineer to allocate the work in such a manner that one work does not hinder the smooth functioning of the other one. The purpose of positioning a Site Engineer is not just to pass on work instructions to site personnel. He should also monitor their work and supervise their operation.

He is to be held responsible for any untoward activity occurring in the site. This is only to impose upon him the unflinching commitment in his duty. How far this could be brought into practice is a different thing.

Many accidents occur due to the ignorance of the workers. More clearly expressing is due to vague instructions or improper work instructions passed on to the site personnel by the Site Engineer.

The workers are absolutely sincere in work and even in the absence of a Site In Charge or Site Engineer, they will carry on the work with dedication. This was amply justified in the second site by workers.

All that they need is clarity in instructions. Guidance in confusion. Support in the face of a problem. They look up for these due to their inability only in solving the issues. The Site Engineer should be a person of such a calibre to ensure all these to the workers. If this is ensured, majority of the work accidents could be averted.

It is true that doing a work with half knowledge is more dangerous than doing it with no knowledge. In the second case, there may be a fear of an untoward incident, harping in the minds of the workers to restrain them from embracing accidents. Whereas, by not fully knowing, doing a hotchpotch job only leads to accidents. Controlling the site personnel in this regard is the prime duty of the Site Engineer.

In a nut shell, the Site Engineer should ensure proper training to the personnel in their work, in their machineries and also on the other machineries deployed at the site, at least so much so to the extent of protecting themselves from those machineries simultaneously on job. This will definitely boost up the morale of the workers and they would also feel confident enough in their functioning.

It is to be noted here that “Training, that is job specific, must be provided to all employee levels so that they fully understand and are aware of the hazard which they may be exposed to while performing their job duties”.

**(Source: Page 161, Book Name: Safety Management – A Guide for Facility Managers – Second Edition. Author: Joseph F Gustin. Copyright@2008, by The Fairmont Press, Published by the Fairmont Press, Inc, 700, Indian Trail, Lilburn, GA 30047. Printed in the United States of America. ISBN: 0 – 8247 – 5040 – 3)**

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Thorough knowledge of the work being performed by them, bolstered by self confidence will ensure full productivity and accident free execution of the projects.

### **ADHERENCE TO SITE SAFETY**

This gains top most priority in the Project Manager’s Agenda. By nature, construction workers are not well educated. They choose this profession, more out of compulsion. In fact, during harvest season, it is very difficult to get construction workers. They have a pretty good demand in agriculture fields. They are reasonably paid there too. It is a risk free work and almost, all the workers prefer to go there only.

They opt to come for construction labour only during off season. Majority of construction workers are basically agriculture workers. They, traditionally know agriculture and are comfortable in that. Construction job, they accept, more out of compulsion. Hence, their involvement in the work is also a debatable topic. But, they can be definitely moulded to any way that is expected of them. That work should be done only by the Site Engineer and the Project Manager.

They are fully conscious of the risks factors accosting them at the site. Taking courage and braving the problems, they work. They cannot expressly make their demand to the contractor for providing safety measures for their bother free work at the site. Any arguments of theirs will only drive them out of job. The fear of being jobless forces them work in any condition of risk with a tight lip.

Both the Contractor and also the Builder owe the responsibility in ensuring the safety of the operating personnel at the site. In the event of any untoward incident, both of them are to be made accountable.

Noxious items are to be kept aside in a separate place with a caution warning. Any movement towards that should be approved by the Site In Charge. This is only to ensure absolute safety system at the site.

First Aid Kit with medicines should be at the site always.

### **PERSONAL PROTECTIVE EQUIPMENTS (PPE)**

It was observed that even in the second site which was using more of construction machineries, many of the site personnel were not wearing the PPEs. While the site workers were wearing hardhats, other important things were noticeably missing. Hand gloves were totally missing.

In multi storied buildings, most of the fatal incidents are due to fall from the height. A fall in the ground floor is resulting in minor injury and that from tall floors causes major accidents or at times, even ending in fatalities. It was noted with dismay that even in the second site none of the workers was wearing fall protection guards. They were doing the work in a rather capricious manner. This would, definitely, create a sort of 'befalling danger' in their minds and the very feeling itself will make them nervous and shatters the attention in the work. This consequently ends in accidents. The Contractor, to a large extent and the builder too to some extent, are to be squarely responsible for such things.

In reality, both of them go scot free due to obvious reasons. The worst hit are only the hapless workers. It is quite pertinent to mention here that "the way to prevent accidents is to nip them in the bud by correcting faults of persons, by forestalling repetitions of unsafe acts and by doing something about unsafe conditions"

**(Source: Page 121, Book Name: The Effective Supervisor. Author: John Adair. Copyright The Industrial Society. Published by: Jaico Publishing House, 121, Mahatma Gandhi Road, Mumbai 400 001 in agreement with The Industrial Society, Robert Hyde House, 48, Bryanston Square, London W1H7LN. ISBN: 10: 81 – 7224 – 103 – 8)**

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It is suggested that the authorities who give permission for construction of multi storied buildings should also own up the responsibility of making surprise visits at the sites to get First Hand information of what is actually going on in the site. For any violations, the people should be punished sternly.

If punishment is inflicted on the contractor and the builder for such outrage in flouting safety aspects, automatically it will streamline the whole issue and the poor workers will be safe in their work.

Climbing the ladder with weights should be totally avoided. Weights such as bricks, cement, sand and tools should come through a hoist. Unfortunately, the workers are forced to carry on these themselves and this causes breakage of the ladder and accidents.

Broad based aluminium ladders should only be used at the sites. Ladders made of bamboo should never be used at all. Surprisingly, most of the ladders found at the first site were made of wood and bamboo only. A few ladders were found to be tied with cloths as a cushion support. (Either cushion support or to cover up the bends and breaks).

Climbing the scaffolds with weights is absolutely dangerous. Cracks and Breaks are sure to happen. This was given scant attention at both the sites. For site accidents, these are the very common causes.

Electrical wires are yet another thing. The wirings in the construction sites are always hanging loose and a small slip will even cost the life. It is just impossible for a worker, carrying full load on his head and all around to be very wary on walking. He moves like a robot and his life should not be exposed to such dangers.

The workers should be fully guided and supported by Site Engineer as regards the safety and security of the work they perform. The site personnel repose absolute faith in the Site Engineer who has a moral responsibility in this regard. In fact, his duty is to ensure smooth functioning of the work at the site.

It is quite relevant here to note that "a process for establishing a shared understanding about what is to be achieved and how it is to be achieved, an approach to managing people which increases the probability of achieving job related success".

**(Source: Page 70, Book Name: Performance Management – Multi Disciplinary Perspectives. Edited by: Richard Thorpe and Jacky Holloway. First Published 2008 by: PALGRAVE MACMILLAN, Hound mills, Basingstoke, Hampshire RG21 6XS and 175, Fifth Avenue, New York, NY 10010. ISBN: 13: 978 – 1 – 4039 – 4761 – 1 and ISBN: 10: 1 – 4039 – 4761 – 9)**

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The Site In Charge/Site Engineer should work in perfect tandem with the workers for speedy execution of the project.

While it is the job of the contractor to ensure PPE to his workers, the builder's representatives, viz, Site Engineer and Project Manager should ensure everything properly for safe operation at the site. For the problems

at the site or anything arising out of lack of adherence at the site, the builder should only be held accountable. But, how far all these are in actuality is a big question.

### **HR ISSUES AT THE SITE**

It is the duty of the Site Engineer to ensure that the site is, apart from keeping it on physical fitness, having hassle free work atmosphere. It is a general fact that workers always get into squabbles amongst themselves and also with their superiors. The laborious work condition is one thing and the other is that they always harbour a feeling of distrust in their minds. They feel, perhaps right too, that they know the work, by sheer experience, much better than the Site Engineer. This is the basic reason for altercations with the superiors. Even a casual remark of a co-worker will spark into an issue.

Handling the construction workers is an art and the Site Engineer/Project Manager should be an expert in that. To take them in to their hands, they have to initially go along with them. If this knack is followed, they will be just like a bonded labour.

For many of the HR problems at the site, ego is the cause. The high handed behaviour of the Site Engineer will just break the cordial work relations at the site and a sort of hostility will set in. The result of this is rework. Frequent reworks, besides causing annoyance to everyone, will only inflict cost penalty to the builder by eroding his legitimate profit.

Apart from delay in project execution, the builder will only be at stake.

A Sr. Official of the second site made a private remark that young engineers are highly egoistic and they are in fact the cause for any unrest at the site or HR issues cropping up. Their approach to an issue is highly bookish and they just brush aside the words of even the experienced site personnel. This, over a period of time, causes a sort of rift and bursts into HR issues.

It is to be noted that for any site issue, workers alone should not be blamed and the Site Engineer/Project Manager should also be kept accountable for the same.

### **DIFFERENT INSTRUCTIONS FROM DIFFERENT PEOPLE**

It is necessary that work instructions should come only from a single source. That source must have clarity in the instructions being issued to the site personnel. While the Site In Charge is only a Supervisor at the site, the Site Engineer should ensure that people are given sufficiently in advance about the work schedule.

In other words, work schedule should be prepared in such a manner that the instructions should be valid for one full week, as far as the workers are concerned. They should be fed with work activities for one full week. This will enable them plan and ensure smooth go of the work.

Sudden change in instructions will only throw things out of gear. First, workers will be annoyed at the change of instructions. They have to be physically and mentally prepared to take up the different assignment. This would be more acute when the instructions are conflicting because the personnel would be in utter confusion as to whose instructions should be adhered to.

There should be perfect co-ordination between Site Engineer and Project Manager in chalking out the work schedule. The schedule, once made should be stuck to without any change. Any adjustments or change in the schedule should be planned in such a way that it is safely carried forward in the next week schedule. The smartness of the Project Manager lies in this.

Frequent changes in the work schedule speak bad on the part of the Site Official. It has two negative impacts – one, from the point of view of workers, their assessment of the Site Engineer and Project Manager would be so poor and second, it will only delay things and will also lead to mess up of activities, resulting in rework.

### **BE A LEADER AND MOTIVATOR**

It is quite essential that the Site Engineer and Project Manager should be people of exceptional calibre and quality. In fact, the entire site is entrusted to the Project Manager who is like the Captain of a Ship.

He must be a good planner. He should structure the schedule of activities to all in a sufficiently advance manner so that everybody is quite aware of their role of performance at the site.

He should be a Master in problem solving. He should be easily accessible even to the least calibre worker. Any one should be in a position to meet him to address a problem and get the solution for the same.

He must be a Motivator. He should take the best out of each and every personnel operating at the site. He is expected to be a person of vision. More than with the site personnel, he should also maintain excellent contacts with the Suppliers and Vendors so that site activities do not come to a halt due to any delay on the part of the supplier or vendor. This is an additional and outstanding talent that he must possess, in the interest of the site and the operating personnel.

He must possess great self confidence and should also promote same in the minds of all the people working under him. Any job done with good confidence is fast finished and smooth finished. He should be an outstanding person by himself and his greatness lies in grooming up his subordinates/site personnel too in emulating such lofty character.

It is a very important statement to note that “the Project Manager must have Core Self Evaluation, ie, positive self regard. It is to be noted that a positive core self evaluation implies sensitivity to others and to the environment so that relationships with others are strengthened rather than weakened, developed rather than destroyed”.

**(Source: Page No. 84, Book Name: Developing Management Skills – 7<sup>th</sup> edition. Authors: David A Whetten and Kim S Cameron. Copyright @ 2007, 2005, 2002, 1998 by Pearson Education Inc. Upper Saddle River, New Jersey, 07458. Pearson Prentice Hall, All rights reserved. Printed in the United States of America. ISBN: 0 – 13 – 174742 – 8) [ 5 ]**

## CONCLUSION

Safety measures were paid scant attention in both the sites. While this was virtually nil at the first site, barely satisfactory was at the second site. What has really caused anxiety was that the second site too which was using more of construction machineries was not following and complying with the safety measures expected to be at the site, given the volume of activities. In fact, this is a common scenario in most of the multi storied sites. Law should be enforced strictly and noncompliance should be sternly dealt with.

Bickering takes place amongst workers quite often. Language barrier is one of the reasons. But, this can be definitely straightened with closer supervision of the Site In Charge and strict instructions from the Site Engineer/Project Manager.

## RECOMMENDATIONS

The authorities who issue approval for construction of multi storied buildings should also be empowered to visit the sites for inspection. In the event of any noncompliance being observed either in regard to the plan or adherence to safety measures, they should fine the Builder (who in turn will take up with the Contractor). The life of site personnel will be safe only then.

The workers are people of brown than brain. They can be easily shaped up to any mould needed. It should be the skill and calibre of the Project Manager/Site Engineer to get this done. Once the confidence of the workers is won, half the hurdles are removed. Not simply leaving it to the contractor, the builder and his representative (Site Engineer/Project Manager) should also own up moral responsibility for the same.

It is a fact that once an accident takes place at the site, particularly fatalities, the morality of other workers will get shattered. They will be gripped with a consternation throughout. This will belittle their productivity. This apart, the workers would only prefer to switch over to other sites for work. Mentally, they would be prepared to abandon the site. They would not hesitate to even break away from the Contractor.

Considering all above, labour concerns should be given the due respect and attention by the Builder and also the Contractor. Money and Materials will be of no use when Men are not there to perform the work. Hence, always have consideration for the workmen and of course, it is only for the good of the Builder for safe and speedy execution of the project.