



## International Journal OF Engineering Sciences & Management Research

### COST SAVING IN MULTI STOREYED BUILDING CONSTRUCTION

S Radhakrishnan<sup>\*1</sup> & Dr. K G Selvan<sup>2</sup>

<sup>\*1</sup>PhD Research Scholar, PRIST University, Thanjavur 613403

<sup>2</sup>Associate Dean, PRIST School of Business, PRIST University, Thanjavur

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#### ABSTRACT

The recent demonetisation had very badly affected the construction industry where, almost, all the projects big and small, came to a standstill. The Industry is now fully poised with a renewed vigour for growth.

The RERA is imposing stringent regulations on the Builders and any violation is being sternly dealt with. The Buyers are in an advantageous position with more transparency from the builders and also in their fully complying with the prescription of building practice.

The small builders who construct up to two floors pay scant attention in adhering to RERA regulations.

#### INTRODUCTION

##### Methodology

Visit to the construction sites in Chennai City and outskirts and from availability of secondary data.

Contours	Details
No. of sites visited	8
Up to 2 floors	3
Beyond 2 floors	5
Site with Lift facilities	5
Gym	5
With Community Hall	2
With Community Hall, Swimming Pool and Super Market	1

##### How to Contain Costs?

Costs are nothing but expenses. While expenses are to be necessarily incurred, the ways and means prudently pursued in reducing the quantum of expenses are called “cost cutting techniques” which contribute to containing costs.

The Land Cost, Planning and Approval Cost, Registration Expenses etc., are fixed costs and are of one time incurrence. Cost of Labour, Cost of Materials, Transportation Costs etc., are variable costs which grow in proportion to size and quality of construction.

##### Be thorough in Plan and Design

Big and Established Builders are very careful in planning and drawing the building design. It is a long drawn out process but it is made just once only and no relooking of revision or alteration whatever, later.

From basement to top floor, work goes on in military discipline without even the slightest deviation. This takes their reputation to sky high. Besides, customers are also happy that their flat is exactly as per the size and measurements indicated in the offer. The price they paid is for the full sq. ft. as defined in their offer.

The small builders, whereas, in anticipation of quick sales, are prepared to make any number of modifications as per customers' choice. Their simple calculation of cash inflow, interest cost and waiting period make them ignore even statutory requirements. The thing is, the purchaser, will be in trouble, later.

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The writer personally saw that in a two storeyed building of 8 apartments, 3 apartments had different internal measurements, though coming within the total sq. ft. indicated. The builder said that they had to yield in to the desires of customers.

One important point these small builders ignore is that their deviation from the plan approval will only throw the purchasers into problems later. Not only that, the safety of the construction will also become questionable. They are also ignorant of the fact that these additional features will only result in cost penalty to the builder.

They can sell the apartment, perhaps, quickly but at reduced profits.

Once Design is made and plan approval obtained, it is wise to proceed with construction only as per the plan without any alterations. This will ensure accrued profits as per projected ones at the beginning itself.

### Use only Quality Materials

A good quality product can never be sold at a cheap price. Never get lured by low price. Some small builders, in their anxiety to get more profits, go in for cheap priced products, especially in piping etc., which will normally escape the attention of the purchasers and difficult to notice as well

In a private chat, the Site In charge of a Builder, made a mention that in a project that was completed about two years ago, there are plenty of complaints in pipe connection leaking. They ventured on a new brand came up in the market, for sheer price benefit and these people were made their 'Test Track'.

Big builders pay equally careful attention in selection of piping as well. The quality of the pipes they fix will have greater strength and pipe life in withstanding corrosion under insulation.

It is worthwhile noting that "Corrosion Under Insulation (CUI) is a significant threat to any piping system or holding tank which operates at lower temperatures in humid environments. The degree of CUI type corrosion depends upon a combination of pipe temperature, insulation thickness, vapour barrier and humidity".

**(Source: Page no. 474 of book "Principles of Material Science" authored by S Mohan, V Arjunan, Sujin P Jose and M Kanchanamala by MJP Publishers, Chennai 600005, Year 2013)**

[ 1 ]

### Be Mindful of Storing

Many builders do take advance action in planning, organising and sourcing the materials from various vendors. But one important thing, especially the small builders, forget is that proper storing of the materials is a must and that matters a lot. In fact, even in the Multi National Companies (MNCs), this problem is prevalent. Scant attention on this important aspect will prove costly.

Poorly stored or carelessly kept materials lose their shine and aesthetics. Continuous exposure to sun or even mild downpour will badly affect the quality of materials. Cement is a highly vulnerable one. In fact, damp atmosphere will have serious impact on cement. A few minutes rain will literally turn the cement into a piece of rock.

In one site it was noticed that cement bags were stored in an open ground. A large polythene cover was spread over the bags. Technically, such exposure will have consequences on the quality of cement.

Big builders take extra precaution, particularly in storing the cement bags. They safely keep them in a go-down. Transporters were given strict instruction that they should not unload the bags just like that at the site but only stake them carefully in the go-down. Though the go-down was only temporary till the construction was finished, it was full-fledged in safety aspects.

The poorly stored materials used in construction will erode the strength of the building over a period of time, as the materials themselves deteriorated in strength and quality by the casual storing at the site.

Since the effect is not immediate but only imminent after some time, small builders, who are quick in concluding the sale and finishing the construction, easily fall a prey to this, either knowingly or by sheer ignorance.



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Proper storing will ensure perfect quality and strength of the materials.

The amount of money spent in this connection is something like a safe investment yielding permanent returns. In one site where the purchasers were offered premium features, a thoroughly built go-down was there where all the cement bags, paint boxes and other things were stored and well maintained.

When the writer asked a question what is the use of that go-down after completion of the construction, the Site Engineer promptly replied that it would be converted in to a fully furnished 'Security Room'. Big Builders are always Big not only in construction but also in proper utilization of each and everything.

It is pertinent to note that "Masonry Units should be stored in a dry place on platforms, off the ground. Units stored on the ground are hard to clean and may absorb salts or other deleterious materials. They should never be allowed to become coated with ice or snow. Careless storage increases the cost of construction and decreases quality assurance".

**(Source: Structural Engineering Hand Book by Edwin H Gaylord Jr., Charles N. Gaylord and James E Stallmeyer (pages 15 – 20 Masonry Construction Point no. 22 – Storing), Fourth Edition, Mc Graw Hill, ISBN 0-07-023724-7).**

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### **Procurement Strategy promotes Savings**

The cost economics that the big builders predominantly enjoy is due to prudent procurement strategy they follow.

They have more than one supplier for the various inputs they use. Cement, Steel, Bricks and Sand and for the other items as well, they do procurement from at least two sources. The underlying reason is that however good and prompt the supplier is, dependence on a single source of supply is always risky. Any problems at his end may directly affect the construction work. Hence, as a matter of business policy, they have two suppliers of repute in business. The business is shared in such a manner that both are satisfied suppliers and assured of continuous business prospects.

With this strategy, they also enjoy substantial business discount which directly contributes to cost savings. For each material, two suppliers. Business reasonably shared by both. The suppliers and also the Builder – Both are Happy.

Another thing they cleverly follow is that they have a sort of Rate Contract. They give assured off take for the year. They determine how many projects they would undertake in a year. Accordingly, their cash flow arrangements are made, in advance.

With this clear picture, they also chalk out their requirement of materials, for all the projects – ongoing and in the pipeline. The supply price is fixed for the year with only the transportation costs varying, to place of delivery. They enjoy tremendous cost saving this way.

It is to be noted that this is possible for only big builders whose procurements are huge and projects are more. Small builders cannot do this as their off take is minimum only. They are also happy with local procurement, irrespective of the price.

For mega projects, funding is a major thing. Capital is pumped in continuously. No project would ever get delayed for want of money. While rotation of money is reasonably maintained, they largely resort to private money lending which is always assured, but at exorbitant rate of interest. Probably, the cost savings they get in prudent purchase strategy help them to bear the brunt of interest.

### **How to fix delivery schedule in Materials**

While small builders often run into material supply disruptions and consequently have to slow down their activities, mega builders never have this problem at all.

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At closer observation and personal discussions, it was revealed that their material requirements are frozen ahead of the project start. Apart from freezing the annual requirements consolidating the various projects, they also do expert categorising of classification of materials mainly by their (a) value, (b) availability and (c) suppliers list. They classify the materials as (1) materials of high value (2) materials which are required in large quantities at short notice (3) materials which are required at longer lead time

The requirements and suppliers list are matched, studied and action taken.

Further, it was also observed that except a few, even big builders resort to hiring of major construction equipment such as JCB, Cranes etc., Since they do not have continuous use for these, they find hiring most economical.

The procurement pattern of Large Builders stays compressed in to the following style.

- (i) Long delivery equipment
- (ii) Special materials and alloys
- (iii) Common materials in short supply
- (iv) Heavy construction equipment and tools
- (v) Services and system requirements
- (vi) Transportation systems and
- (vii) Financial resources

**(Source: Total Construction Project Management by George J. Ritz, Mc Graw Hill, Copy right 1994, ISBN 13:978-0-07-052986 and ISBN 10:0-07-052986-8, pages 193 – 194)**

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### Never entertain Change Orders

Change Orders is a common feature with small builders. In their anxiety to sell off the flats fast, they are prepared to make any number of alterations in the project, either with approval or by blatant violation.

They are ignorant or unmindful that such alterations would even affect the stability of construction.

Big builders are quite firm in this regard. They are very clear that no change order is accepted by them at all. The construction will go through exactly as per the original plan only. This gives them a clear position in the market as Market Leader.

Their Reliability is built on their Rigidity in strictly adhering to the building practices.

Their long experience has enabled them in clearly assessing and implementing the requirements of purchasers.

They are also fully aware of what would be requirements of different families and people of different culture.

Their construction pattern and building facilities largely cater to all these fine requirements too. Hence, their experience and wisdom give them full protection in this regard.

Right at broaching the talk, they make it eminently clear that no change order is possible by them at all. They entertain further only after this is fully understood and agreed to by the buyers.

That is why they remain Market Leader in the Field.

The Site Engineer of a Mega Builder said that it is not just the cost of additional jobs alone that come as a penalty. There are much more in this.

To be very precise in assessing the actual cost burden, the following points should also be borne in mind for correct reflection of actual cost overrun.

- Cost of additional labour
- Cost of additional materials and the proportionate transportation cost
- Rental cost of machinery and equipment including hand tools
- Additional cost of supervision

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- Risk of such additional work or change orders leading to consequential damages
- Cost of additional interest for the additional capital spent
- Last but not the least, reduction of proportionate profits

(Source: **Project Management in Construction** by Sidney M. Levy, Mc Graw Hill Fifth edition Copy right 2007. ISBN – 13:978-0-07-146417-8 & ISBN – 10:0-07-145417-4. Page 187)

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### Safety Stock

Prudent purchase through Supply Chain Management is the practice followed by mega builders. They never bank upon a single source only, however good and dependable they are. For unhindered supplies, they also have an additional supplier of quality and reliability.

Business volatilities cannot be predicted at all. While the Builder is protected by Rate Contract for assured supplies on the agreed terms and conditions for the contract period, the Suppliers are also equally protected by the conditions of Force Majeure of the same Rate Contract.

While the supplier is accountable for wilful delays, for delays arising out of Force Majeure conditions, supplier cannot be penalised and he enjoys full legal protection.

The important point to be noted here is whether the supplier is penalised or not is not a matter from the builder's point of view. He should not suffer for delayed supply of materials, even coming under force majeure.

Mega Builders always follow "Safety Stock of Materials".

While Cement and Steel are freely available by different manufacturers, the things of constant threat are Sand and Bricks. Some builders own their own quarries. Some other big builders take advance action in bulk procurement and storage of these two critical items – Sand and Bricks.

Halting the work for just one week will lead to heavy loss to the builder – largely the interest loss. The unhindered supply of capital is done by borrowing from private money lenders at unimaginable interest rates. Hence, the builder is always particular that work should never be stopped at all.

As such, always have buffer stock of critical items.

Another way of circumventing this problem is by developing reliable supply source. The supplier should be in a position to deliver the materials, at the shortest notice. JIT – Just In Time is the expectation of the builders from the suppliers.

For successful result of JIT, three important things are to be always taken care. People, Process and Technology. The people at both the Builder end and also Supplier end must be fully committed in ensuring the success of JIT.

Big Builders enjoy the technological advancements in construction.

Process is the system of co-ordination between Builder and Supplier. A Brilliant Site Engineer must have excellent co-ordination not only with Supplier, but also with Transporter and Go-down In Charge. All these things are necessary to ensure that work does not suffer even for one day.

With excellent technological advancements, communication is made absolutely simple and status of things is seen on hourly basis. Planning and Scheduling of activities can be very easily and precisely made for perfect execution.

(Source: **Construction Management Principles and Practice** by Alan Griffith and Paul Watson first published 2004 by Palgrave Macmillan ISBN 10:0-333-96878-6 and ISBN 13:978-0-333-96878-9, pages 201 – 209)

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### Price of the Apartment is for the Quality of the Apartment

It must be noted that the price fixed by the builder is basically for the quality of the apartment.



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Fixed Costs, Variable Costs and other Incidental costs may sum up for arriving at the Cost Sheet Preparation whereas from the customers' point of view, the price they pay for an apartment is for the excellent quality and durability it is expected to have.

The builder is only solely accountable for ensuring this. The RERA regulations strictly lay down restrictions on the part of the Builder for total compliance of the Act.

As such, the builder should be more concerned in the Quality aspect of construction.

Technically, Masonry Quality may be classified using the following components.

- (i) Quality of Materials
- (ii) Quality of Workmanship and
- (iii) Site Control

While the first one rests with the Suppliers to ensure supply of quality materials, the workmanship and site control are fully the responsibility of the Builders.

For workmanship, there should be excellent co-ordination between the workforce and the Site In charge/Site Engineer. The Site In Charge should be a man of vision, leadership, commitment and above all, an Enabler. Plainly speaking, he is the main connection between the workers and the builder.

Some workers in a site made a private remark that their Site Engineer was a rude person with negative mind set. This always led to quarrels and poor finish (workmanship) of the work. A Fault Finding In Charge is only a liability to the builder.

Site Control is not just ensuring timely supply of men and materials alone, above all else, it is maintenance of HR functions at the site which have direct bearing on the workmanship.

Big Builders have a trained team of personnel in this regard.

**(Source: Construction and Management Recent Advances edited by R R Wakefield and D G Carmichael. Proceedings of the National Construction and Management Conference – Sydney/Australia/17-18<sup>th</sup> February 1994. Published by A A Balkema, Rotterdam,, Copyright 1994 ISBN 90 5410 2004). [ 6 ]**

### CONCLUSION

In all the sites visited, it was observed that workers were fully committed to work. Even when Site In Charge was not there, they were quietly on the job.

The small builders are not strictly adhering to Governmental regulations. They are not even aware of the consequences of violation.

They are too flexible with customers, in clinching the deal. They would not mind carrying out any alterations as preferred by the customers.

They would also venture into 'extra construction' over and above the plan approval, for sale to 'cash parties'.

Big and Established Builders proceed with construction strictly as per plan approval only and they would never entertain any alterations in their construction. In fact, at discussion stage itself they express clearly on this.

Big builders enjoy the benefit of cost advantage by prudent procurement practice. They have a dedicated team of personnel in the site.

They enter into Contract Agreement with Labour Contractors. They have only most minimum number of personnel in their payroll.

### RECOMMENDATIONS

All the Builders – big or small, must comply with the planning approval, to avoid complications to customers, at a later stage.



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Supply Chain Management practice must be followed for cost economics.

Alternative uses must be explored and brought into construction. Brick and Sand are always in great demand and supply is also erratic. Small builders are worst hit on this score. Fly Ash Bricks are to be used, as much as possible.

Similarly, M Sand, ie., Man Made Sand must be used as a replacement to river sand. M Sand is gaining popularity now. Government should come forward in promoting this.

There should be fortnightly meetings between Builder and the Site Personnel. Developments can be understood by the Builder and appropriate action for problem solving can also be initiated by him. The site personnel will become more disciplined in their performance.