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Benefits of 5S technique for construction company

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Abstract: Introduction to 5S, a standard of cleanliness, order, safety, and sustainability in the workplace, has proven to be a valuable tool for keeping a construction company's facilities in top condition. The 5S method has been proven to increase workplace productivity, reduce waste & accidents, and improve the overall working environment. The benefits of 5S go beyond the workplace; the method has been shown to increase the quality of life for the people who live and work in a facility, and has even been shown to have an impact on the community as a whole. This paper will provide a brief introduction to the 5S method, its origins and evolution, and the current state of the 5S in the construction industry. In this research work I have taken case study of four sites in which two sites where 5S concept were use, and remaining two sites where 5S concept not use. For these four sites I have prepared one checklist for efficiency of 5S on site. Ahead I have filled the checklist and compared all sites. In the results of case studies are, 91% and 87% efficiency of 5S in those sites where 5S method was used as compared to those sites where 5S method was not used in this sites efficiency of 5S is 24% and 14%.

Index Terms -Lean construction, 5S, Construction company

I. INTRODUCTION

Lean Construction is a method that decreases cost, material management, reduce time and effort on a construction site. And also, this would reduce the worthless and maximize the standard. Not only the desired outcome would be to maximize the value and results of a project but also keep down unnecessary aspects and delays by using the theory of lean construction. It is possible when standard construction towards is combined with a clear and brief understanding of project data and two kind of management, planning, and management pattern. It looks hard to recognize, but the vital of this process is to use what is necessary without the inclusion anything. Management team can achieve their aim through clever planning and action and with the help and support of all workers, engineer, contractor.

In lean construction 5S is a well-ordered management that can be used from floor area of company to performance of work, which are not only about cleanliness but also maximizes adaptability and profits. It is a structure that basis on creating capability and value using particular ideas and appliance. In 5S Waste monitoring, analysis, participation, as well as waste removal operation are also involved. Sometimes 5S use as 5S or Five S, which are five Japanese name used to explain the entire 5S system. Each and every term of this concept starts with an S. In Japanese, the five S's are:

- A. Seiri (Sort)
- B. Seiton (Set in Order)
- C. Seiso (Shine)
- D. Seiketsu (Standardize)
- E. Shitsuke (Sustain)

II. OBJECTIVE

- To study 5S technique in lean construction.
- To improve project practices by the use of 5S.
- To reduce the construction waste and increase project profitability.

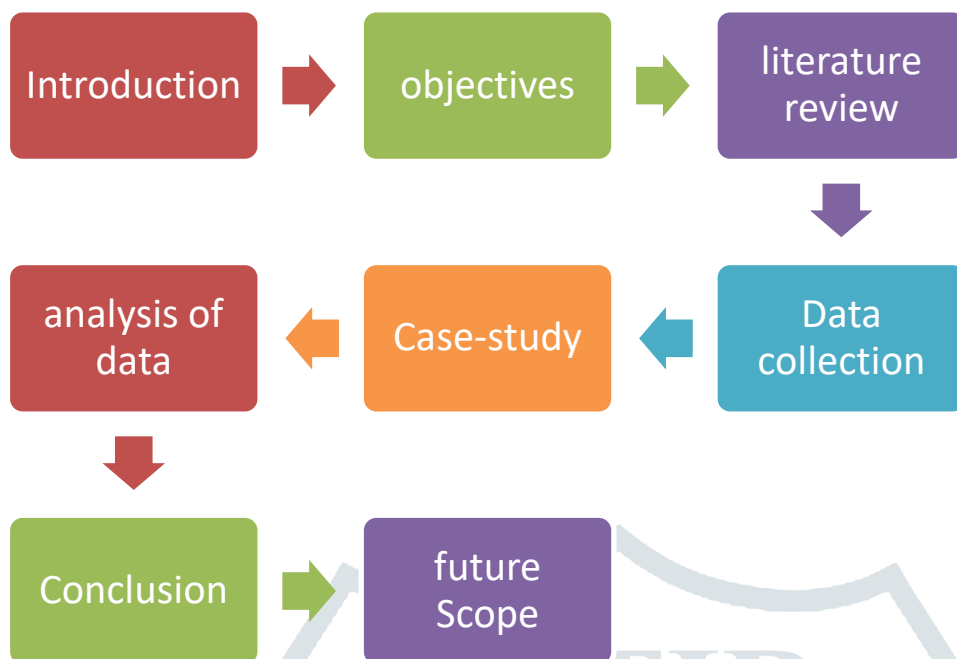
III. NEED OF STUDY

The construction industry of India is the second most employment industry after the agriculture industry, and the fastest growing industry in India. Major problem in construction site is the workplace organized, clean, safe and productive this will be overcome by some tools and technique; Lean construction techniques are more important for that.

In the construction sector, there is a lack of Awareness regarding the 5S lean construction technique.

IV. RESEARCH METHODOLOGY

Table 1 Figure 1



V. DATA COLLECTION

Generally, data collection is a plan of action which research objective can be questioned and it can be classified into two types which are quantitative approach and qualitative approach. In this study qualitative approach will be taken and by qualitative approach I have taken 4 case studies of real site data. In these case studies 2 sites are where 5s method is used and remaining 2 sites are where 5s method is not used which are demonstrated below, then I have collected data regarding 5S method.

Case study: 1

Table 2 Case study 1

Type of project	Corporate office
Total area of site	10820 sq.m.
No. of floors	G+10
No. of wing	1
Use of 5S method	Yes

Case study: 2

Table 3 Case study 2

Type of project	Residential building
Total area of site	20,000 sq.ft.
No. of floors	G + 11 floors with 4 basement
No. of wing	4
Use of 5S method	Yes

Case study: 3*Table 4 Case study 3*

Type of project	Commercial building
Total area of site	6,50,000 Sq.ft.
No. of floors	G + 5 floors with 2 basements
No. of wing	4
Use of 5S method	No

Case study: 4*Table 5 Case study 4*

Type of project	Residential building
Total area of site	8557 sq.m.
No. of floors	G + 11 floors with 2 basements
No. of wing	6
Use of 5S method	No

One checklist are create for the purpose of, how 5S method use on construction site, in this checklist give rating out of 10 and note the remarks, this checklist are use on above four site and fill it. Then see the result difference between the 5S concept site and not use of 5S concept site.

Checklist of 5S method on construction site*Table 6 Checklist of 5S*

Sr. no	Checks	Rating (0 to 10)
1.	Only the required material is present in the area.	
2.	All unwanted, unnecessary material not required for site are removed from area.	
3.	All tripping hazards such as electrical wires & equipment cables are removed from working area.	
4.	All type of material is clearly identified.	
5.	Material placed properly in location.	
6.	The location of material is properly labeled and marking.	
7.	Floor area of site free from debris, unwanted material, wrappers.	
8.	All machinery stored in a manner and kept clean and in good working condition.	
9.	All type of wastage is consistently and regularly cleaned up and remove from workplace.	
10.	Identify scrap yard location and display to identify type of scrap.	
11.	5S training and motivation program conducted once in month.	

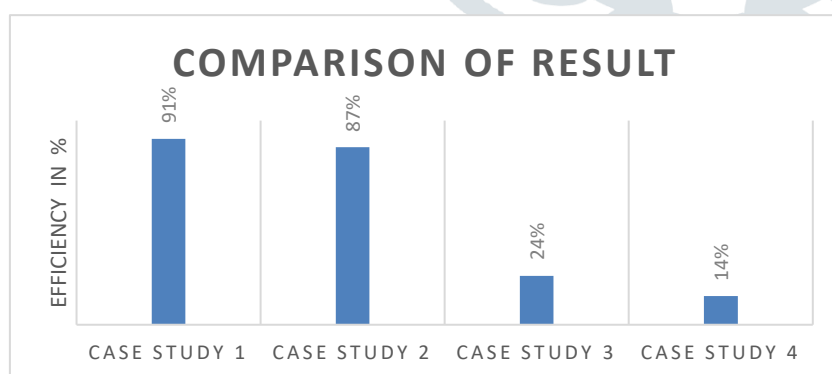
VI. DATA ANALYSIS

Data collected from four construction site in which two site use the 5S method other two site not use the 5S method, the checklist of 5S fill on four site and the result are below:

Table 7 Comparison of all case studies

Sr. no	Checks	Case study 1	Case study 2	Case study 3	Case study 4
		5S(✓)	5S(✓)	5S(✗)	5S(✗)
		Rating (0-10)	Rating (0-10)	Rating (0-10)	Rating (0-10)
1.	Only the required material is present in the area.	9	10	4	3
2.	All unwanted, unnecessary material not required for site are removed from area.	8	8	3	2
3.	All tripping hazards such as electrical wires & equipment cables are removed from working area.	10	7	2	1
4.	All type of material is clearly identified.	8	9	5	2
5.	Material placed properly in location.	10	7	4	1
6.	The location of material is properly labeled and marking.	9	10	0	0
7.	Floor area of site free from debris, unwanted material, wrappers.	9	8	2	3
8.	All machinery stored in a manner and kept clean and in good working condition.	10	10	4	2
9.	All type of wastage is consistently and regularly cleaned up and remove from workplace.	9	8	3	2
10.	Identify scrap yard location and display to identify type of scrap.	8	9	0	0
11.	5S training and motivation program conducted once in month.	10	10	0	0
	Result	91%	87%	24%	14%

Table 8 Results



The above results are efficiency of 5S on construction Site.

From the data analysis and results of above table wind up that the 5S concept are more important for construction site and it will be affecting in the site work and there are number of benefits of this concept while using on site.

Benefits of 5S method are below:

1. Improve the productivity of various construction activity.
2. Superior usage of the site area.
3. Control of losing material on site.
4. Reduce the wastage of material.
5. Increase the safety of worker.
6. Reduce the chances of losing material on site.

7. Increase the life span of material.
8. Time reduction in material finding.
9. Aesthetic view will be increase.
10. Proper material management.
11. Reduce the accident rate.
12. Effect on all over cost indirectly.
13. More comfortable for worker on site.
14. Better work atmosphere on site.
15. Maintain the cleanliness on site.
16. Increase the communication process on site.
17. Reduce the cycle time of construction activity.
18. Item will be easily recognized.
19. Increase the standard of quality.
20. Increase the reputation of construction company.
21. Reduce the maintenance cost of material.

VII.RESULT AND CONCLUSION

In this study we have use 5S principle of lean construction application on the construction company, all five S apply on the two-construction site. To conclude, the implementation of 5S on construction site is reduce the wastage of material, good material management, reduce the cost of construction work and improve quality of work on site. 5S practice on construction site gives best result. The main reason behind not has been using 5S method on construction site is less awareness around people and it needs to aware public regarding this spontaneous system and their benefits. From the work on construction site conclude that the Main factors of 5S is Knowledge of 5S, reduce waste, Cleanliness, Tools and item set in store, Material management, Safety, Floor of site utilization, Team work. In the results of case studies are, 91% and 87% efficiency of 5S in those sites where 5S method was used as compared to those sites where 5S method was not used in this sites efficiency of 5S is 24% and 14%.

Future scope

The thesis work is carried out in Ahmedabad region it covers majority of construction company of the Ahmedabad. So, there is a scope of the study in the Gujarat state construction company and other cities of India.

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