

**ABSTRACT**

Construction industry is second largest contributor to India's GDP, at the same time globalisation and urbanisation the demand for efficient, construction is generated. The demand of quality construction requires close project monitoring and continuous efforts to improvise. The solution to meet this relevant demand is to have accountability of the work done, which can be done with construction and records. Construction records and documents are the mirrors of project; it not only reflects the state of project but also boosts quality work and quality control. Irrespective of the usefulness of it, their are various causes and sources of errors in record keeping and benefits too, is also described. It will not be exaggerated to state that construction documents and record helps in sustainable project management. Based on relevant literature review and pilot survey, key differences among the construction documents and records are described at the same time, phase wise key documents and records 44 in number are stated. Thus, giving complete idea regarding documents and records and role played by them in risk mitigation.

**KEYWORDS:** GDP, urbanisation, project management, record keeping, documents, sustainable, risk mitigation

**INTRODUCTION**

India is multi- billion economy in which construction industry stands second largest contributor in GDP (1). With ever-increasing population and urbanisation, the demand for economical, sustainable, and quality construction can be understood very well. To fulfil such requirements the solution is to have strong project management, continuous learning from the experiences, and monitoring of various process within the project life cycle. Any mass construction involves large amount of money, various risks and requires long time span making it difficult to remember numerous things related to construction, for the same construction documents and records come handy to the stakeholders. Thus, one can understand the impact of construction documents and records on the construction industry itself.

**LITERATURE REVIEW**

**Kolawale A.R. et.al.** defined record management and also stated records are tool to compare works if similar kind. Records prove helpful for minimising material waste and financial losses and fulfil during litigation. Researchers state that photographs so clicked act as proof and be clicked at least twice a week but be dully signed by the in charge. Minutes of project meetings should be preserved and the document so exchanged is dully signed and stamped. Paper concludes stating all records be provided to all the stake holders for higher efficiency.

**Mehdi Nourbakhsh et.al.** served IT firms dealing primly with small and medium sized construction companies to settle at the conclusion that, such size companies have specific yet simple need when dealing with document management. Depending upon the available work environment, firms prefer simple softwares to handle on site and off site record management. As the respective firms being in developing stages have limited staff, software for record management is affordable and easy to use with just no bondages to access the records. Interestingly firm demand for such software which would work in slow internet zones. Getting more precise firms demand

the software be supporting synchronising the data and be accessible by mobiles too and file sharing be easy yet affordable. With the survey, software named “Drop Box” was concluded to be most preferred software. **Dosumu Oluwaseum et. al.** surveyed various stake holders in the project and conducted online survey with assistance of Likert Scale categorised common causes of errors in documentation which generally are bill of quantity, drawings, specification, from of contact and schedules. Influence of stakeholders on generation of errors in construction documents were clients, architects, quantity surveyors, engineers, and finally builder. Common causes of errors among bill of quantity, drawings, specification, from of contract and schedules are described. On the same steps effects of errors in documentation were abandonment of work, delays, rework, dissatisfaction of owner, lack of confidence of consultants, loss of consultants reputation, frustration of stakeholders, lack of concentration on other projects, discourages investors, and designers profits were computed. Remedies over it are also forwarded viz. floating comprehensive information, refining communication skills among the stakeholders, better project management and if possible using better reliable document management systems.

**Cheng Wang et. al.** defined project learning with supporting literature review stated that it is process and documentation based process. Researchers carried work in Malaysia combining literature survey and interviewed 4 experienced personnel from the industry. Qualitative analysis was done on the responses so obtained from the questionnaire survey. Researchers described project learning process, and also state it mainly as a process and documentation based process. Descriptive statistics method was used to identify key problems in documentation quality 8 in number in which “accuracy, clarity, and timeliness issues” ranked the list. Main causes of poor documentation quality 13 in number of which lack of time ranked first. Good project learning technique viz inter project evaluation topped among 14 such techniques. Finally benefits of project learning 13 in number were stated of which staffs efficiency enhancement topped the list.

**Ronald E.Dowing** described general importance of project records on project completion and execution. Typical requirement for project documents are viz. progress report, project schedule, labour productivity report, labour utilisation record, earned value data and so on. Records like bid documents guides and plays important role in guiding the work and to scrutinize it. At same time progress, report shows the actual work progress which is to be maintained by the contractor. Irrespective of contractors firm size may fail to maintain the work progress only because of lack of willingness of on site staff, which in return may lead to loss of productivity. Researcher further discuss common methods to quantify the loss of productivity i.e. Measure mile method, total cost/ modified total cost, industry studies, jury verdict, discrete damages analysis. Researchers suggest that the progress reports and other relevant documents must clearly be stated in contract documents itself so as to avoid ambiguity and proper action be taken if contractors fails to do so, it is vital to use simple and clear language so as to clarify the requirement of the client.

From the above literature construction document can described as a drafted information about the futuristic plans that are to be executed, which may be in form of paper, soft copy i.e. electronic matter, written, printed, etc. Thus document can simply be stated as anything in writing which denotes someone’s thinking (owners) but represented in specific language. The main purpose of document is to flow the information among the stakeholders and convey the messages which in best possible way, that mainly guides each other for the work to be done. This documents are generated in Plan phase of construction and thus can be edited or even changed.

Construction records are the evidences of the work done in project life cycle. Documents when processed the result is nothing but seen / drafted onto records. In construction records are the permanent information about the construction work done e.g. concreting done, material used, various cash receipts etc. But authentication of them is expected i.e. signed or stamped by the competent, relevant authority and cannot be edited or changed later. They are generally come into existence in the Do phase of construction.

***Thus, it will not be wrong to say that all records are documents but not all documents are records.***

## KEY DIFFERENCES WITHIN CONSTRUCTION DOCUMENTS AND RECORDS

**Table 1. Key Differences within Construction Documents and Records**

Sr. No.	CONSTRUCTION DOCUMENTS	CONSTRUCTION RECORDS
1.	Documents are the pieces of written, printed, electronic material to provide information	Records are the evidences of work done in past intentionally maintained to be used as a proof

2	They can be edited and even revised	They cannot be edited or revised
3	Do not act as evidence in court of law	Do act as evidence in the court of law
4	May be kept for short period of time	Mostly kept for long time

### PURPOSE OF DOCUMENT / RECORD MANAGEMENT

The basic goal of documents and records are to ease the human work and assist whenever needed. Some general purpose of it are briefed below.

- i. Document/ record management should be used to maintain the productivity and speed of work.
- ii. To forward the errors in the work done , to lower the monetary losses, material losses
- iii. To maintain phase wise account of work done.
- iv. To replicate the reality on- off site, and about the stakeholders.
- v. To provide strong evidence and base for future planning and assist any decision making.

### PHASE WISE CONSTRUCTION DOCUMENTS AND RECORDS.

With changing phase of project different documents records come to existence, on the principles of pilot survey, government engineers, PMC's, site engineers, were surveyed to draft the key construction documents and records used in construction project and are described below.

**Table 2 Phase Wise required Construction Documents and Records**

Sr. No.	Construction Project Phase	Key Document Records Required
1.	CONCEPT FEASIBILITY PHASE	[1] Pre planning notes about the project
		[2] Planning about man, machine, material and money
		[3] No Objection Certificates
		[4] Permissions from local authorities
		[5] Pre planning notes about the project
2.	TENDERING	[6] Tender notice
		[7] Specification
		[8] Tender validity
		[9] Tender award certificate
		[10] Quotations
		[11] Quantity calculation
		[12] Work order
		[13] Time schedules
		[14] Escalation conditions
		[15] Negotiation rates
3.	CONTRACTING	[16] Special condition

		[17] Scope of work
		[18] Price related documents
		[19] Conditions+ penalty+
		[20] Conditions of sub-contracting
		[21] Project budget
		[22] Detailed budget with supportive calculation
		[23] Royalties + branding
4.	CONSTRUCTION WORK	[24] Architectural / structural / plumbing etc drawings
		[25] General instructions
		[26] Safety schedule (manual)
		[27] Store records
		[28] Extra work records
		[29] Work changes
		[30] Test report for quality
		[31] Remuneration / payments done+ payments received
		[32] Taxes paid
		[33] Running accounts bills
		[34] Work order
		[35] Work check certificates
		[36] RMC Checklists
		[37] Work permit
		[38] Delay Analysis
		[39] CPM/PERT/BAR Charts
		[40] Material record
		[41] Project schedule
5.	COMPLETION + MAINTENANCE	[42] Completion certificate
		[43] Final certificate
		[44] Repair/ maintenance schedule

## OVERVIEW

- i. The results and discussion may be combined into a common section or obtainable separately. They may also be broken into subsets with short, revealing captions. Records and documents are tools that can and should be used as a tool to meet the project completion with higher efficiency, better productivity. Documents records help to curtail firm's expenditure on material, labours, maintain quality of work, and mitigate various on-off site risks.
- ii. Documents and records differ from project to project that may be conventional paper work, photographs or latest electronic software but all support to keep track of construction activities and control over the project progress, and helps as evidence in the court of Law.
- iii. Irrespective of the impact of documentation and record keeping their are various sources of errors in it, which are as simple as errors in calculation of bill of quantity, drawings, and ambiguities in the

specification and contract documents. The main causes of errors are lack of knowledge of documentation skills, less time to maintain key documents and records. Lack of willingness the employee's of-on project site also influences the record keeping process.

- iv. However, the vulnerable impact of poor record keeping leads to project time overrun, abandonment of work, loss of reputation in the market and frustration among the stakeholder and various other risks. Remedies over it is to float comprehensive information and refining communication skills among the stakeholders, better project management and if possible enabling better, reliable document management systems, skills up gradation of employees dealing with records and documentation.

## CONCLUSION

Construction documents and records are inseparable part of any construction project. They differ from project to project and stage to stage of the respective project. Interestingly number of ways for documentation and records keeping are available and can be used according to the usage, requirement, available resources, and class of construction to be done. This records and documents, helps in continuous learning from past mistakes, stands as evidence during litigation, refines the work method, quality control thus leading to customer satisfaction. Records and documents are important tools for timely project completion with efficient use of man, machine, material, and money, which leads to overall sustainable project.

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