

## Cash Flow Of High Rise Residential Building

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Its my Pleasure to prepare this paper under the valuable guidance of Prof M. R.Apte, prof. emeritus civil department, M.I.T .Pune ,and also I liked to thanks Prof. S. S. Pimplikar H.O.D. of civil department M.I.T. Pune for providing me this opportunity.

**Abstract-** Construction projects are complex and risky. Even profitable construction companies can fail due to poor cash flow. In order to survive in this rapidly changing environment, effective cash flow management is essential. Many unforeseen factors affect a construction project's cash flow. This thesis also examines the impact of these factors on contractor cash flow during the construction process. Financial Management is very important in every construction projects to make availability of funds in high rise buildings.

From the perspectives of both owner and contractor, Managing cash flow is vital to a successful project. Cash flow is where the project cost meets the schedule. Cash flow projections developed from credible project execution plans become the basis of project controls. A poor cash flow projection could lead to an inability to fund the project or impose undue stress to the project execution team. A project typically goes through multiple phases prior to the final approval such as quantity of items, estimation of costs by using market rates ,scheduling activities by using bar chart and execution as per plan. Cash flow projection is also prepared to support funding decision at each phase. The sophistication of cash flow projection increases as it moves toward the final project approval. Each project is unique in its execution and hence in its cash flow projection.

This paper highlights what is cash flow and its importance in construction project. And how the cash flow of the project get generated with the help of Microsoft project software by adding activities and resources and how by tracking of the project get planned and actual duration of the project

### **Introduction-**

Cash flow is the life line of a business. Many start-up companies fail because of insufficient cash flow. From the perspectives of both owner and contractor, managing cash flow is vital to a successful project. Cash flow projections developed from credible project execution plans become the basis of project controls. Combining the cash flow and earned value technique, a project can track the real status of progress and detect any early cost deviation.

Cash flow means the amount of cash being received and spent during a defined period of time. Without positive cash flows, basic obligations such as payments to suppliers and payrolls cannot be met, in project level, even a high-profit project may turn out to be a failure if cash shortfall suddenly occurs.

Financial planning is central to the survival of any construction company. This is essential as lack of funds had been identified as the most common cause of business failure, and can lead to the failure of profitable and growing firms as well as those declining. On the other hand, a permanent surplus of funds, while less damaging is in itself an uneconomic state of affairs. As such, there is a need for adequate timing of fund availability in construction and deployment of excess fund to more productive use.

A cash flow management directly proportional to the progress of work if improper cash flow management occurs then it affects on project progress and may be delay occurs in completion of work so the cash flow management is the backbone of any construction project. Poor cash flow projection could lead to an inability to fund the project or impose undue stress to the project execution team. A project typically goes through multiple phases prior to the final approval. Cost estimates, schedule and an execution plan are developed at each phase. Cash flow projection is also prepared to support funding decision at each phase. The sophistication of cash flow projection

increases as it moves toward the final project approval. Each project is unique in its execution and hence in its cash flow projection. However, there are basic concepts that are applicable to development of any cash flow project particularly in case of Residential Buildings or Group of High Rise Buildings.

### **Factor affecting cash flow**

Table-1

<b>Categories</b>	<b>Factors</b>	
<b>1. Financial Management</b>	1-Change of progress payment duration 2-Change of progress payment conditions 3- Receiving front payment 4-Large retention percent 5-Delay in releasing retention 6-Financial position	7-Change of progress payment duration 8-Change of progress payment conditions
<b>2. Sub-contractor</b>	1-Decisions to sub-contract 2-Over/under measurement	3-Failure of sub-contractor 4-Renting vs. buying equipment
<b>3. Suppliers</b>	1-Delay in making payments 2-Procurement problems	3-Delay in delivery 4-Price change 5-Material shortage
<b>4. Prior to construction</b>	1-Poor design 2-Inaccurate bid items	3-Estimating strategies 4-Cash flow forecasting 5-Competitors
<b>5. During Construction</b>	1-Mistakes in executing the work 2-Lack of adequate insurance 3-Replacement of defective work	4-Project delayed 5-Material and equipment shortages 6-Lack of skilled labor 7-Improper planning and management
<b>6. Communication skills</b>	1-Disputes between contractor and owner – 2-Poor communication contractor staff, suppliers	3-Relations with owner 4-Relations with consultant team
<b>7. Others</b>	1-Weather condition 2-Positive change order (addition work) 3 Negative change order (Omit work)	4-Inability to manage change orders 5-Number of claims and amounts held by clients

Typical cash flow on a construction project consists of:-

1. Cash out such as bid costs, preconstruction costs engineering, design, mobilization, etc., materials and supplies, equipment and equipment rentals, payments of subcontracts, labor And overhead; and
2. Cash in such as billings , less retentions , claims and change orders. Advance Payments, Bank Loans

The factors that affect cash flows are the duration of the project, the retention conditions, the times for receiving payments from the client, credit arrangement with suppliers or vendors, equipment rentals, and times of payments to subcontractors, etc

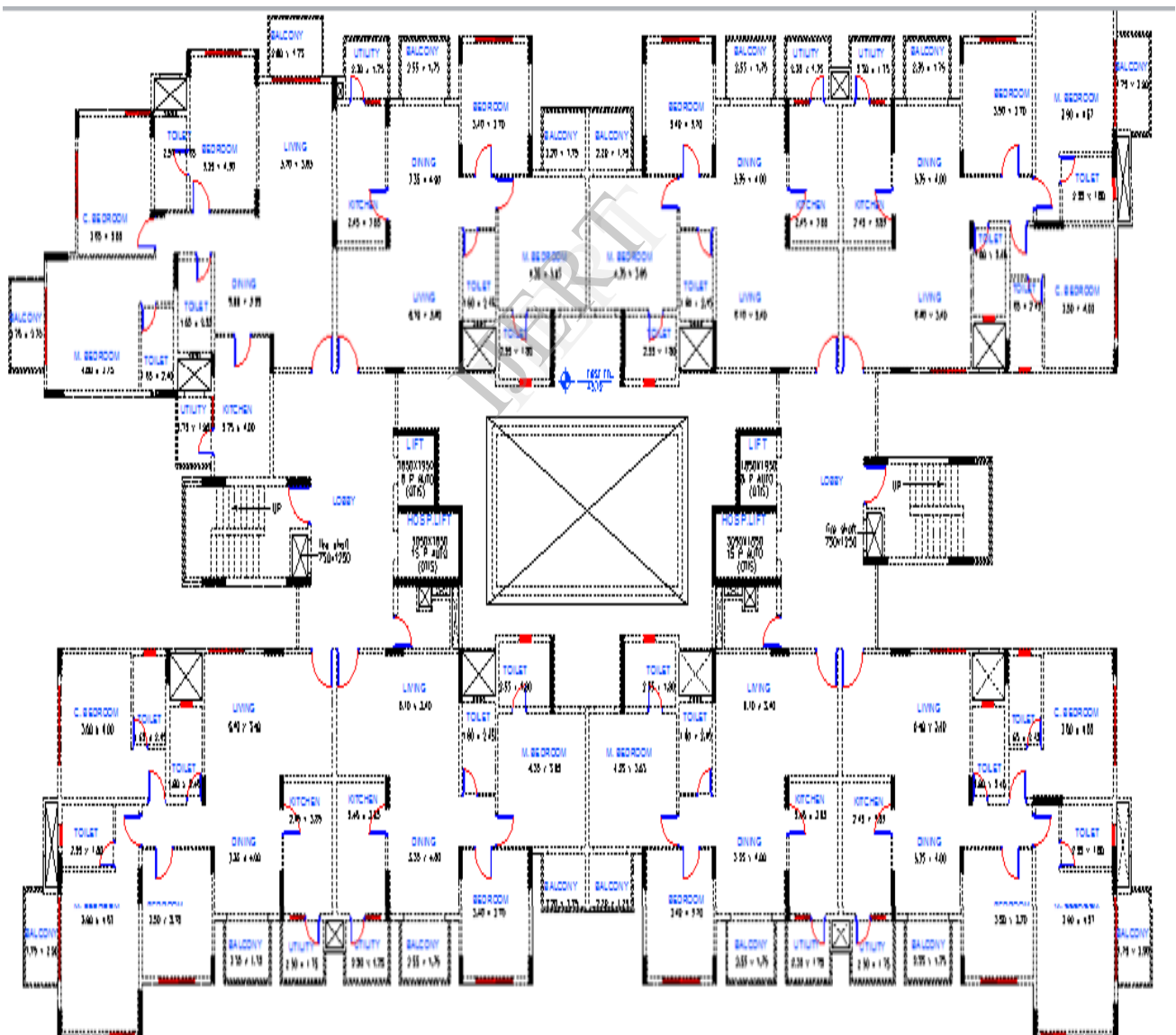
The project cash flow projection is derived from an execution plan and estimated expenditure. Many projects treat estimated expenditures as cash flow projections. In fact, cash flow generally lags actual expenditure by one accounting period; i.e., one month. A planned project cash flow is the baseline for comparison with the actual project expenditure. Deviation from the planned cash flow is analyzed by the project controls specialist.

### Microsoft project software-

Microsoft Project is a project management software program, developed and sold by Microsoft, which is designed to assist a project manager in developing a plan, assigning resources to tasks, tracking progress, managing the budget, and analyzing workloads. Project creates budgets based on assignment work and resource rates. Resource includes people, equipment and materials. Each resource can have its own calendar, which defines what days and shifts a resource is available. Resource rates are used to calculate resource assignment costs which are rolled up and summarized at the resource level. Each resource can be assigned to multiple tasks in multiple plans and each task can be assigned multiple resources, and the application schedules task work based on the resource availability as defined in the resource calendars.

Example – Here given the case study of a ABC construction project of a 5 floored residential building as an example

Typical project plan of ABC project is given below-

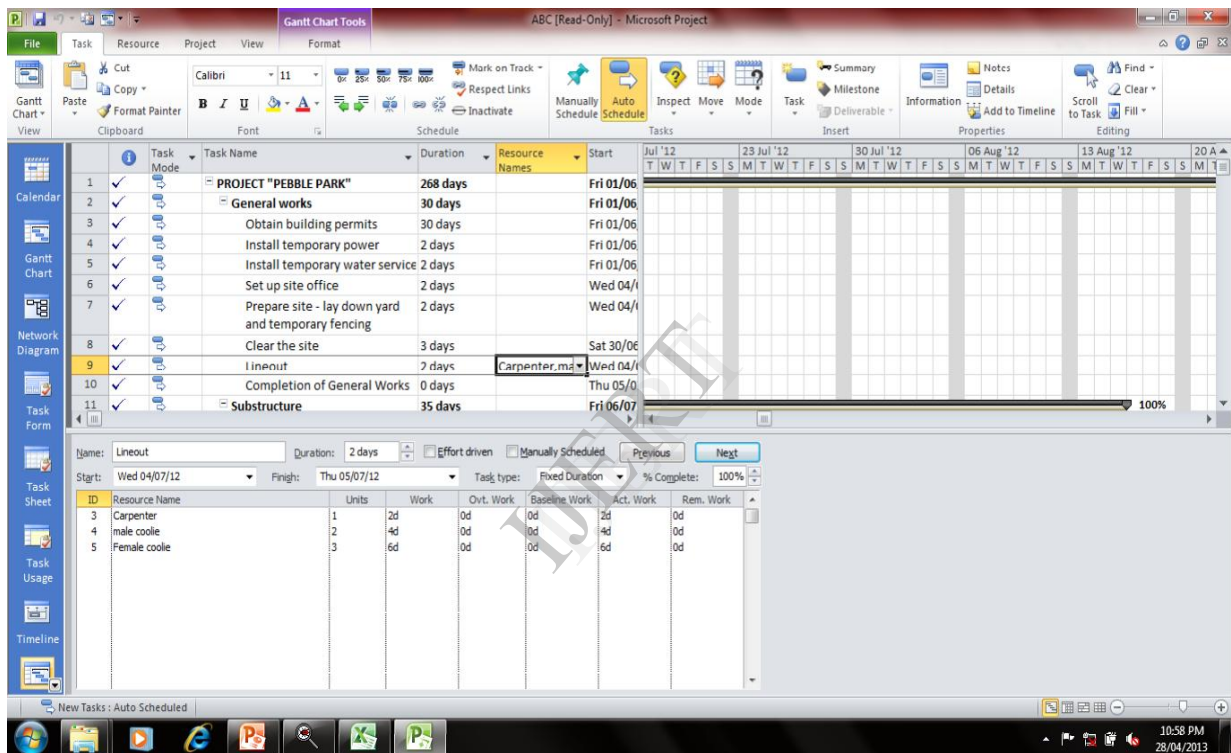


TYPICAL FLOOR PLAN

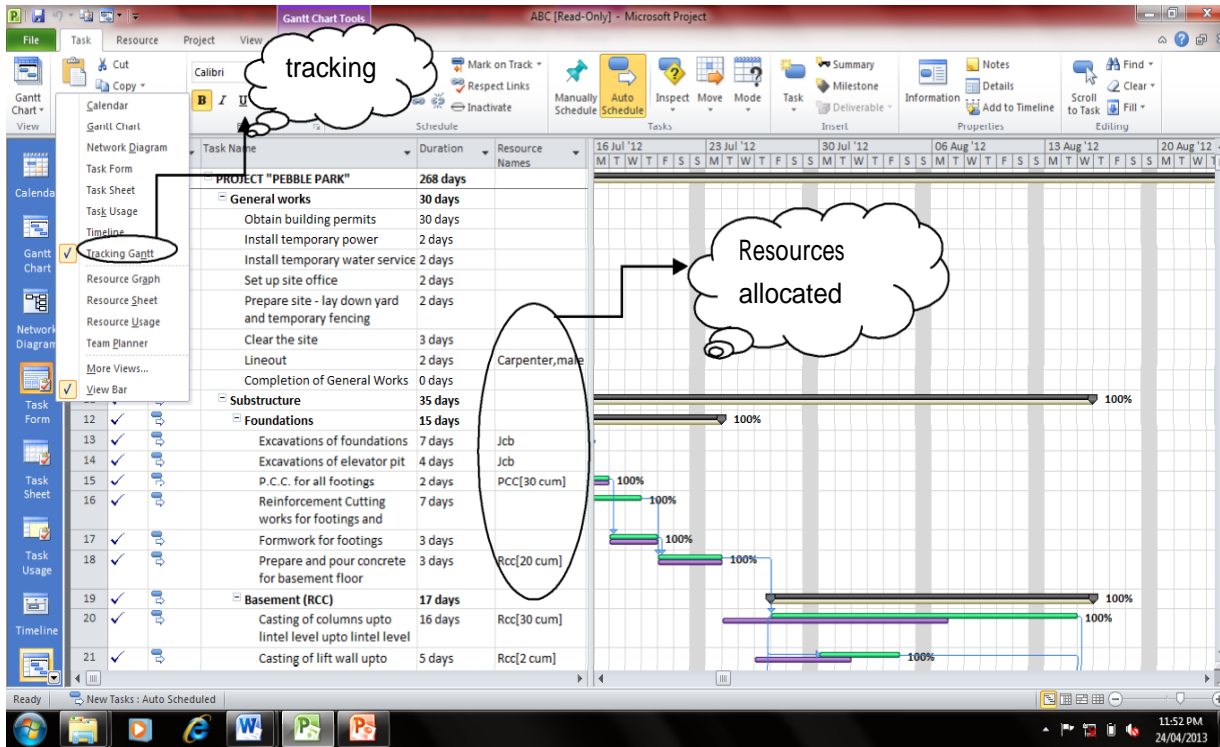
Methodology adapted to get cash flow with the help of Microsoft project software-

1. First set activities and its durations
2. Then assign the resources to the activities
3. Then tracking is done to get planned and actual duration of the project
4. Then from the visual reports selecting resource summary report get resource summary report
5. And then from visual reports selecting cash flow report cash flow get generated.

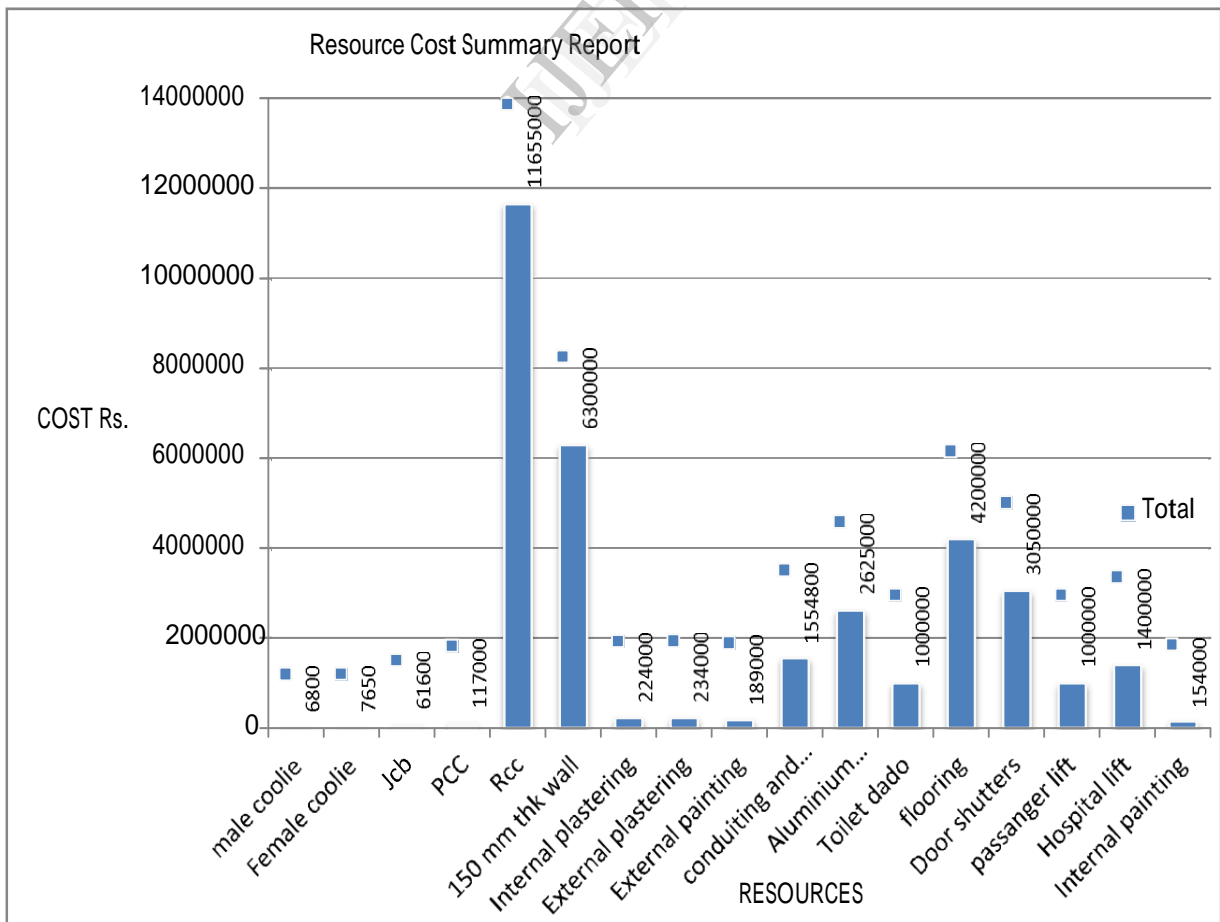
Activities has been set and how to allocate the resources of the activities given below

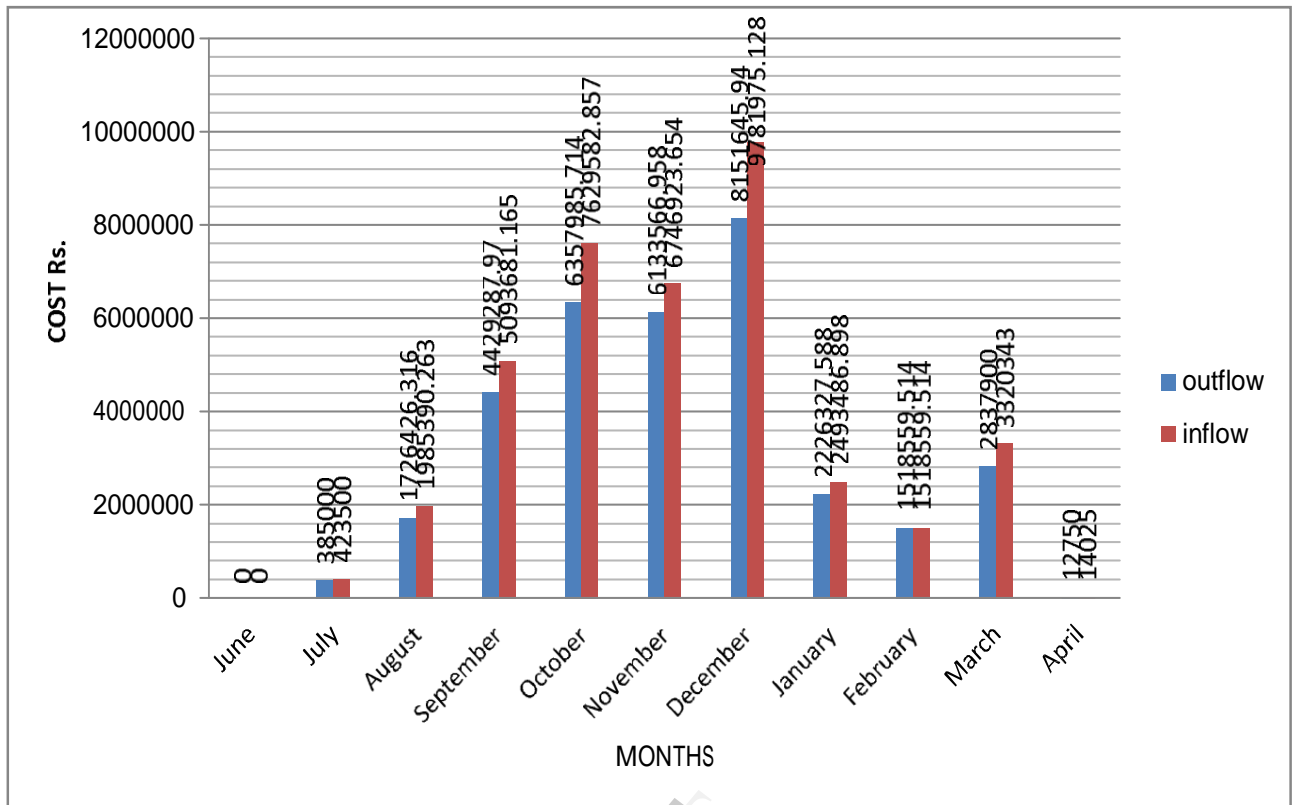


All the resources assigned and how the tracking is done by tracking Gantt shown below and planned and actual duration get generated as shown.



Resource cost summary report generated by adding resources as shown below-





#### Cash flow report

Cash outflow- Rs.33779450

Cash inflow-Rs.37157395

By selecting cash flow reports from visual reports cash flow get generated as shown above.

Above graph shows how money comes as an inflow of project and how it is utilized as outflow month wise throughout project duration and combinedly it shows cash flow of project

We are going to implement this methodology in construction of high rise building executed in Pune, which will be discussed in subsequent work it includes mainly points are-

1. Estimating of quantities of all the items like materials, equipment and labors in total project-  
To find Detail Estimation of each and every activity .estimation of substructure and superstructure, general work, plastering, painting, brickwork, plastering, in detail .very small quantity should be consider.
2. Monitoring the cost regarding all the materials, equipment and labors and consumables-  
To monitor detail cost item wise and month wise required for material used, equipment are hired or not rent bases. Which type of equipment are used and there number. No. of labor used, wages being paid for them.
3. Cash in such as billings, less retentions, claims and change orders. Advance Payments, Bank Loans-  
According to this phase get money as inflow for different kind of projects as-
  - If builder directly constructing project then he takes money percentage wise from clients depend upon construction criteria.
  - If working on government project then contractor side gets material advance to mobilize material and start the work and get running payments every month
  - In some projects taken loan from the bank to finance the project in primary stages on some fixed interest amount, and there is recovery against that bank loan
4. Preparation Cash flow statement for the all the expenses-

Cash flow is the base of any project. A poor cash flow projection could lead to the failure of project or impose undue stress to the project execution plan .A project typically goes through phases prior to the final approval. cost estimates ,schedule and an execution plan are developed at each phase. Proper cash flow management is crucial to



the survival of a construction company because cash is the most important resource for its day to day activities. In order to survive in this rapidly changing environment, effective cash flow management is essential. Many unforeseen factors affect a construction project's cash flow. A cash flow management directly proportional to the progress of work if improper cash flow management occurs then it affects on project progress and may be delay occurs in completion of work so the cash flow management is the backbone of any construction project.

#### 5 Using Microsoft project -

Using Microsoft project software giving actual and planned duration of project and then by assigning resources, materials get the cash flow of project generated, that will be the ultimate required output of the construction project.

This will be dealt in details in next papers on this topic.

#### **Conclusion-**

From all above things we can conclude that-

1. Cash flow is the backbone of any construction project and if we fail to manage that then project can fail.
2. All the items should be considered in cash flow like material cost according to its quantity, equipment's charges, labor wages, fixed cost, overhead expenses and all direct and indirect cost expenses.
3. Poor cash flow hampers on construction project and results in delay of project completion, increase in costs etc.
4. Special attention required in case of execution of High Rise Buildings due to increase in variables, which needs special study and analysis experienced at different stages in construction

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