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# The Evaluation of Payback period for Formwork system

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**Abstract -** *Formwork is a temporary structure which supports fresh concrete till it becomes strong enough to remain stable. A builder or contractor chooses either to invest on the formwork material or hire from a vendor in his construction work. The consumer using or choosing formwork based upon the maximum repetitions and its cost.*

***Key Words*: Formwork, Contractor, Repetition, Cost, Stable, etc...**

## 1. FORMWORK SYSTEM

A form is defined as a temporary structure or mould for the support of concrete while it is setting and gaining sufficient strength to be self-supporting. Formwork has a broader definition: it is the total system of support for freshly placed concrete including the mould or sheathing which contacts the concrete, as well as all supporting members, hardware, and necessary bracing. Forms are essential to concrete construction. They mould concrete to the desired size and shape and control its position, alignment, and surface contour. Formwork is more than a mould. It is a temporary structure that supports its own weight, the weight of the freshly placed concrete, construction loads such as materials, equipment, and workers, and other possible live loads during construction

- Basic points required to be understood in designing of form work are as stated below:

  a)Rigidity and Durability
  b)Strength
  c) Water-tightness
  d) Easy removal
  e) Surface finish required for concrete in contact with shuttering
  f) Economy

- These are interdependent but shall be considered in totality. Also equally important is the location and purpose of use. In general, it shall be classified into the following categories based on the activity. Form work for ,

  a) Foundations
  b) Floors, coping, lintels
  c) Slabs and beams
  d) Column
  e) Staircase
  f) Domes, arches
  g) Precast moulds
  h) Walls, parapet

### 1.1 Classification of Formworks

Formwork can be classified according to a variety of categories.

### Classification According to Size

In practice, there are only two sizes for formwork small-sized and large-sized. Any size which is designed for operation by workers manually is small-sized. The most common small sized systems are made of timber and aluminum, and are usually in the form of small panels. There is seldom medium-sized formwork. In cases where large-sized formwork is used, the size of the form can be designed as large as practicable to reduce the amount of jointing and to minimize the amount of lift.

### Classification According to Location of Use

Elements in the structure of building have different design and performance requirements. Accordingly, classification can be made as wall formwork, column formwork, beam formwork and slab formwork.

### Classification According to Nature of Operation

Formwork can be operated by manually and other power-lifted methods. Some systems are equipped with degree of mobility to ease the erection and striking processes, or to allow horizontal movement using rollers, rails or tracks. The main manually-operable types of formwork are Aluminum and Timber. They are designed and constructed in ways that they can be completely handled without help of any lifting machines. However, it is labor intensive and is more suitable to be used simpler jobs. Power-lifted formwork can be of the self-climbing and crane-lifted types. Crane-lifted systems are usually in the form of large panels

### Classification According to Brand Name of the Product

Firms can even provide a wide range of services including design support or tender estimating advice. They use of innovative building methods gains attention from various sectors in the community, so advanced formwork systems will become widely adopted. There are several

international companies which produce patented formworks, only leading firms are discussed in the following sections. Appropriate company for the case study is selected after conducting the review of their products. The products are evaluated in terms of its adaptability and applications to developing countries.

Eg:MIVAN,DOKA,PERI

### 1.2 Factors influencing selection of Formwork system

The factors influencing the formwork systems were identified are as shown below.

The four broad categories are:

- General factors
- Building aspects
- Job specific
- Local conditions

The factors, which fall under each category, are:

A. General factors
- Adaptability & flexibility
- Duration & repetition
- Quality and surface finish
- Availability
- Cost
- Safety
- Supply

B. Building aspects
- Type of structure
- Maximum load capacity

C. Job specific
- Time factor
- Accessibility to work
- Erection and dismantling
- Suitability of work for labours

D. Local condition
- Skilled labour requirement

## 2. PAY-BACK PERIOD(PBP) TECHNIQUE

The PBP technique is based on the idea of how much time is needed by the project to generate cash flows sufficient to recover the cost of investments. It can be also used as a criterion for acceptance or rejection of projects in the case that the PBP is higher or lower certain number of years previously defined and to differentiate between projects. The PBP technique is commonly used for evaluating the investments of capital budgeting in companies for many reasons. Firstly, the technique is very easy to apply and understand. Secondly, the technique enables the manager to measure a risk of investment by examining how long it will take to recover the cost of investment. Thirdly, it is comfortable with the desire of manager in generating the liquidity. This issue is linked with pecking-order theory where the managers try to use methods that create immediate liquidity. Fourthly, the technique is used by small and medium companies because it is simple and easy to understand by owners of these companies where the small-medium businesses typically do not engage in long-term planning. On the other hand, the PBP technique has many deficiencies. First, it ignores the cash flows occurring after the payback time, which can lead to the rejection of profitable projects that require a longer recovery period. Second, the PBP does not consider the time value of money in calculating the cash flows. One-way of overcoming this deficiency is to calculate the PBP by appropriate discounting rate of the expected future cash flows. Third, B argues that the PBP technique does not evaluate or show the comprehensive image of the firm performance because it is focus on liquidity but not profitability.

## 3. CONCLUSIONS

Collected information's and data regarding Formwork system and Pay-Back period are studied. The above factors and data are very helpful for the new entrepreneur and firms to know about the Formwork system and Pay-Back period and it also helpful for the contractors.

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